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CHINA SEA PILOT
VOL. I

COMPRISING
THE WESTERN SHORE OF THE CHINA SEA FROM TANJONG PENAWAR, ON THE EASTERN SIDE OF JOHORE, TO FOKAI POINT, BIAS BAY; THE ANAMBAS EILANDEN AND HAINAN ISLAND; ALSO THE ISLANDS AND BANKS BORDERING THE MAIN ROUTE FROM SINGAPORE STRAIT TO HONG KONG

SECOND EDITION
1951

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1951

Addenda and Corrigenda.

No. 17. **REPORTS OF SHOALS OBTAINED BY ECHO SOUNDING.**

No. 18 **AREAS DANGEROUS DUE TO MINES.**

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A Supplement to this volume will generally be published annually until the latter is again taken up for revision.

After the publication of Supplement No. 1, each succeeding supplement cancels the former.

Between the time of the volume being taken up for revision and the publication of the new edition no supplement will be issued, but early in each year a Summary of the Admiralty Notices to Mariners affecting the volume, which have been published during the preceding year, will be issued as a separate publication.

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VOL. I

COMPRISING

THE WESTERN SHORE OF THE CHINA SEA FROM TANJONG PENAWAR, ON THE EASTERN SIDE OF JOHORE, TO FOKAI POINT, BIAS BAY; THE ANAMBAS EILANDEN AND HAINAN ISLAND; ALSO THE ISLANDS AND BANKS BORDERING THE MAIN ROUTE FROM SINGAPORE STRAIT TO HONG KONG

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THE BEARINGS OF LIGHTS ARE GIVEN FROM SEAWARD.

THE LATITUDES AND LONGITUDES GIVEN IN THE TEXT ARE APPROXIMATE.

THE DISTANCES ARE EXPRESSED IN SEA-MILES OF 60 TO A DEGREE OF LATITUDE.

A CABLE'S LENGTH IS ASSUMED TO BE EQUAL TO THE TENTH PART OF A SEA-MILE. IT IS OFTEN ACCEPTED AS BEING ONE-TENTH OF A NAUTICAL MILE.

THE DEPTHS ARE GIVEN BELOW CHART DATUM LEVEL WHERE NOT OTHERWISE STATED.

HEIGHTS ON THE LAND ARE GIVEN ABOVE MEAN LEVEL OF HIGH WATER SPRING TIDES.

FIGURES IN BRACKETS GIVEN AFTER THOSE DENOTING FEET, FATHOMS AND YARDS ARE THEIR EQUIVALENTS IN METRES.

TIME IS EXPRESSED IN THE FOUR-FIGURE NOTATION COMMENCING AT MIDNIGHT.

THE TERM "POWER VESSEL" USED HEREIN INCLUDES ANY VESSEL PROPELLED BY MACHINERY.

A NAME IN BRACKETS, IMMEDIATELY FOLLOWING ANOTHER NAME, IS THE OBSOLETE NAME WHICH IS STILL SHOWN ON THE ADMIRALTY CHARTS. AS A GENERAL RULE, THE BRACKETED NAME IS ONLY INSERTED IN THE DESCRIPTION OF THE PLACE OR OBJECT PREVIOUSLY BEARING THAT NAME.

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Yellow. Red. Blue. Green. Black.

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ADVERTISEMENT TO CHINA SEA PILOT, VOL. I

This volume deals with the western shore of the China sea from Tanjong Penawar, on the eastern side of Johore, to Fokai point, Bias bay; the Anambas eilanden and Hainan island; also the islands and banks bordering the main route from Singapore strait to Hong Kong.

This, the second edition, has been prepared by Captain F. M. Hodgson, R.N., and contains the latest information received in the Hydrographic Department.

The meteorological information has been revised by the Meteorological Office of the Air Ministry. Temperature is expressed in degrees Fahrenheit, rainfall in inches, speed in knots, and distance in sea-miles unless expressly stated otherwise. Information received from meteorological services which do not use these units has been converted into the units mentioned above by the Meteorological Office.

Mariners and others are invited, in the interests of navigation, to forward to the Hydrographer, Admiralty, Oxgate Lane, Cricklewood, London, N.W.2, any information that may come under their notice which would be useful for the correction of the charts and other hydrographic publications issued by the British Admiralty; *early* advice as to newly discovered dangers, the establishment of, or changes in, any aids to navigation, is specially requested.

Copies of a form (H.102) on which to render information can be obtained gratis from the Hydrographer of the Navy, Hydrographic Supplies Establishment, Creechbarrow House, Taunton, Somerset, or from any of the Admiralty Chart Agents in Great Britain and abroad, a list of whom is published, annually, in Admiralty Notice to Mariners No. 2.

By the publication of this volume the first edition of the China Sea Pilot, Vol. I, 1937, and Supplement No. 8, 1950, are cancelled, and all information affecting that work contained in Notices to Mariners up to and including No. 1709 of 1951, has been embodied in this volume. For Temporary and Preliminary Notices to Mariners affecting this edition, the list of Temporary and Preliminary Notices to Mariners in force, published monthly in the weekly edition of the Admiralty Notices to Mariners, should be consulted.

A. DAY,
Rear-Admiral and
Hydrographer of the Navy.

Hydrographic Department,
Admiralty, London,
7th September, 1951.

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GLOSSARIES OF WORDS OCCASIONALLY FOUND ON THE CHARTS AND IN THE SAILING DIRECTIONS

MALAY

Malay.	English.	Malay.	English.
Alang alang	Reeds	Labuan	Anchorage
Ayer	Water	Lama	Old
—— masin	Salt water	Laut	Sea
		Lumpar or Lumpur	Mud
Baharu	New		
Barat	West	Muara	Mouth of a river
Batu	Rock, stone		
Besar	Large, great	Negri	Town
Beting	Shoal, sand		
Burung	Bird	Panjang	Long
Bukit	Hill	Pantei	Coast, seaboard
		Pasir	Sand
Chettek	Shallow	Pisang	Banana
		Prau	Boat, ship
Dalem or Dalam	Deep	Pulau	Island
Darat	Coast, land	Putih	White
Gadong	House	Renda	Low
Gunong	Mountain	Ruma	House
Gusong	Reef of rocks		
		Selat	Channel, strait
Itam	Black	Sungei	River
Jambatan	Mole, jetty	Tanah	Land, country
		Tanjong	Cape, point
Kaler	North	Telok	Bay
Kali	River	Tepilaut	Coast, seaboard
Kampong	Village	Tohor	Shallow
Karang	Coral	Tokong	A rocky treeless islet, or a treeless rock
Kayu	Tree		
Kechil	Little, small		
Kering	Dry	Trumbu	Dangerous hidden shoal
Kidul	South		
Kring	Dry	Trusan	Channel
Kuala	Mouth of a river	Tuwak	Old

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PRINCIPAL POINTS OF THE COMPASS (MALAY)

Malay.	English.	Malay.	English.
Utara	North	Salatan	South
Utara-samata-timor	N.N.E.	Salatan-daya	S.S.W.
Timur-laut	N.E.	Barat-daya	S.W.
Timur-samata utara	E.N.E.	Barata-samata-salatan	W.S.W.
Timur	East	Barat-tapat	West
Timur-tanggara	E.S.E.	Barat-samata-atara	W.N.W.
Tanggara	S.E.	Barat-laut	N.W.
Salatan-tanggara	S.S.E.	Utara barat-laut	N.N.W.

THAI

Thai.	English.	Thai.	English.
Ao, Au	Bay, creek	Lom	Wind
		Lueng	Yellow
Ban, Bang	House, or, if with place-name, village	Mai	New
		Maenam, Menam	River
Bon	On	Monthon	Province, state
		Muang	Town
Chong, Chaung	Strait		
Chong-Kab	Narrow	Nai-kwa	Inner
		Noi	Little, less
Dam	Black	Noi-kwa	Lesser
Deng	Red		
Din	Clay	Pa Dong	Forest
Din-saw-pong	Chalk	Pak	Mouth
Doy	Hill	Pak-nam	Mouth of a river
		Phra-chedi	Pagoda
Fai	Fire, light	Pom	Fort
		Pu-khaw	Mountain
Gao	Old		
Goh	Island	Sai	Sand, gravel
		So-cloke	Rock
Hard	Beach		
Hardzai	Sand beach	Ta-le	Sea
Hin	Stone	Ta-le-sab	Lake
Hlaem	Point, cape	Tai	Siamese
Hnieo	Clay	Tit nua	North
Huai	Stream	Tit tai	South
		Tit tawan-ok	East
Kau	Hill	Tit tawan tok	West
Khao	White	Ti-thort-samor	Anchorage
Klone	Mud	Tong Koong	River bend
Klong	Canal or creek		
Ko, Koh	Island	Wat	Temple
Lang	Lower	Yai	Great
Lek	Small	Yai-kwa	Greater
Lem	Cape, point	Yord	Top

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COASTS OF THAILAND, CAMBODIA AND VIET-NAM

	English.		English.
Culao . . .	Delta island	Mui	Cape
Cua	Mouth of a river	Nui	Mountain, hill
Hon . . .	Island	Rach . . .	Stream, watercourse
Kua . . .	Mouth of a river	Song . . .	River
Lach, Lakh .	Channel, canal	Vung . . .	Bay, cove, estuary

FRENCH

French.	English.	French.	English.
Aiguille . . .	Needle	Mare	Pond
Anse	Bay, creek	Môle	Mole, pier
Avant port . .	Outer port	Mont, Morne . .	Mountain
Baie	Bay, gulf	Musoir . . .	Mole (or pier) head
Banc	Bank, sandbank		
Barre	Bar	Noir, e . . .	Black
Basse	Shoal	Nord	North
Bassin . . .	Basin, dock		
Bouche . . .	Mouth of a river	Ouest	West
Cap	Cape, headland	Passe	Channel, pass
Chenal . . .	Channel	Petit, e . . .	Small
Colline . . .	Hill	Pic	Peak
Côte	Coast	Pierre	Stone
		Piton	Mountain peak
Écueil	Rock, breaker	Plage	Shore, beach
Entrée . . .	Entrance, mouth of a river	Plateau . . .	Table-land, or flat below water
Escarpé, e . .	Bluff	Pointe	Point
Est.	East	Port	Port, harbour
Étang . . .	Lake, pond	Presqu'île . . .	Peninsula
Falaise . . .	Cliff	Quai	Quay, wharf
Fond	Bottom		
Fosse	Ditch, a deep	Rade	Road, roadstead
		Récif	Reef
Golfe	Gulf	Rivière . . .	River
Goulet . . .	Narrow entrance	Roche, Rocher .	Rock
Grand, e . . .	Great, large	Ruisseau . . .	Rivulet
Gros	Great, large		
		Sable	Sand
Haut-fond . .	A shoal	Salines. . . .	Salt water lagoons, salt works
Île	Island, isle	Sud	South
Îlot	Islet		
		Tour	Tower
Jaune	Yellow		
		Vert, e . . .	Green
Lac	Lake	Vieil, vieille, vieux	Old, ancient
		Village. . . .	Village
Marais . . .	Swamp, marsh	Ville	Town

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CHINESE

Chinese.	English.	Chinese.	English.
Ai	A saddle between hills	Ling	Mountain chain, chain of hills
An	Shore, coast	Liu	Stream, current
Cha	Barrier, dam	Men	Pass, gate
Chau	Island	Miao	Temple
Chen, Cheng	Town or city	Mu	A wood
Chi	Ledges, (used in river)	Nan	South
Chi-tuan	Tide rips	Nei	Inner
Chia	Cape	Ni	Mud
Chiang	Harbour or channel		
Chiao	Rocks or reefs	Pa	Embankment, dyke, breakwater
Chiao	Cape or point	Pai	White
Chiao	Bridge	Pan-tao	Peninsula
Chien	Ravine	Pei	North
Chien-tan	Shoal	Ping-mien	Level
Ching	Capital	Pu	A town
Chou, Chow	Island		
Chuang	Village	Sha	Sand, sandbank
Chung-yan	Mainland	Sha-tsui	Sandy spit
Chuntao	Group of islands	Shan	Mountain, hill
Feng	Peak	Shan-hu	Coral
Fu	Commercial village	Shan-hu-chiao	Coral reef
		Shan-tien	Summit
Hai	Sea	Shang	Upper
Hai-wan	Gulf	Shao	Little
Hei	Black	Shen	Province
Ho	River or creek	Shen-lin	Forest
Hsi	West	Shih	City
Hsia	Lower	Shih	Rock, stone (Rocky, stony)
Hsiang	Village, country	Shu	Tree
Hsiao	Small	Shuan-sha	Bar
Hsien	District		
Hsin	New	Ta, Tai	Great
Hsuan	Eddies, whirlpool	Ta	Pagoda
Hu	Lake	Tan	Bank, flat
Huang	Yellow	Tang	Pond, embankment
Hung	Red	Tao	Island, islet
Kan	Dry	Ting	Top
Kang	Ridge, mound	Tou	Headland
Kao	High	Tsui	Cape, point, spit
Kao-yuan	Plateau	Tuan	Rapids
Kiang	River	Tung	East
Kiang-kou	Estuary, or river mouth	Wa	Swamp, swampy
Kou	Ditch	Wai	Outer
Ku-kou	Gorge	Wan	Bay, bend
Lan	Blue	Yai	Bluff, cliff
Li	Gravel, shingle	Yeh-yin	Camp
Li	Inside	Yen	Reef, rock
Lieh-tao	Islands	Yu	Islet

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OFFICIAL ROMANISATION OF THAI

TABLE OF PRONUNCIATION AND TRANSLITERATION

VOWELS

Letters	International phonetic symbol	Royal Institute transliteration	Value
—ะ	a	a	Fr. chat
—ั	a	a	
—า	aː	a	Fr. *a*ge
—ิ	i	i	Engl. s*i*n
—ี	iː	i	Engl. rav*i*ne
—ึ	ø	ư	Form the mouth for I.P.S. y but say ø
—ึ	øː	ư	Same but lengthened
—ึ◌	øː	ư	Same as above but used when vowel final
—ุ	u	u	Engl. p*u*t
—ู	uː	u	Engl. l*oo*t
เ—ะ	e	e	Fr. l*e*s (short)
เ—	eː	e	Fr. é (acute)
แ—ะ	ɛ	æ	Engl. *air* (shortened)
แ—	ɛː	æ	Fr. è (grave)
โ—ะ	o	o	First vowel in Engl. boat
โ—	oː	o	Fr. Rhône
เ—าะ	ɔ	ǫ	Engl. p*o*t
—อ	ɔː	ǫ	Engl. r*aw* (but more open)
เ—อะ	ə	œ	Engl. th*e*
เ—อ	əː	œ	Engl. t*ur*n
เ—ิ—	əː	œ	

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Letters	International phonetic symbol	Royal Institute transliteration	Value
◌ัวะ	ua	ua	First two vowels in Engl. triphthong "squire"
◌ัว	uɪa	ua	Engl. "Who're you?"
เ◌ียะ	ia	ia	Engl. brilliant
เ◌ีย	iɪə	ia	Engl. seer
เ◌ือะ	øa	ừa	no European equivalent
เ◌ือ	øɪa	ừa	
◌ัย	ai	ai	Engl. *I*.
ไ◌, ใ	ai	ai	
◌าย	aɪi	ai	Engl. *eye*, sigh
เ◌า	au	ao	Engl. how
◌าว	aɪu	ao	Engl. loud (stress aɪ)
◌ิว	iu	iu	Engl. fancy *you*
เ◌ว	eɪu	eo	Engl. waywaard
แ◌ว	ɛɪu	æo	Engl. airway
เ◌ียว	iɪo	ieo	Engl. we owe
◌ุย	ui	ui	Fr. *oui* (stress first vowel)
◌ุ◌ย	oi	oi	Engl. snowy
◌ือย	ɔɪi	ɰi	Engl. joy
◌วย	uɪe	uai	Fr. roué
เ◌ือย	øːe	ừai	no European equivalent
เ◌ย	œe	oei	
-ว-	uə	w	Last two vowels in Engl. triphthong fewer
◌ำ	ʌm	am	Almost as Dutch *Amsterdam*
◌รร◌	an	an	Fr. canne
	or ara	ara	Italian cara

Unwritten ɔ / Unwritten ɔː } บวฝบท = BRMBT, *pron.* bɔɪrɔmɔbɔɪt

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SYSTEM OF ORTHOGRAPHY

The following rules for the spelling of geographical names (termed the R.G.S. II system) have been adopted for British official use, and the names in Admiralty Hydrographic publications will be rendered in accordance with these rules as opportunity occurs.

In new editions of the various volumes of sailing directions names are, generally speaking, given in accordance with these rules, but where the name on the chart shows an older rendering of a name, such chart name is given in brackets after the new rendering and will also be given in the Index.

The rules for spelling in the R.G.S. II system are as follows :—

(1) The spelling of every place-name in an independent country or self-governing dominion using the Roman alphabet (including " Roman " alphabets containing extra or modified letters, such as Czech, Serb-Croat, Polish, Romanian, etc.) shall be that adopted by the country or dominion.

(2) In colonial possessions the spelling of such place-names as belong to languages coming under Rule (1) will be spelt in accordance with that rule.

(3) The accents and diacritical marks in official use by the above countries will be retained. Wherever it appears desirable, the pronunciation will be shown by giving the name as transliterated on the system below.

(4) All other place-names throughout the world will be spelled in general accordance with the following system.

The broad features of this system are

(*a*) That vowels are pronounced as in Italian and consonants as in English :

(*b*) That every letter is pronounced, and no redundant letters are used.

This system aims at giving a close approximation to the *local* pronunciation ; but it is recognised that in some languages, notably Russian, Greek, and Arabic, the necessity for letter-for-letter transliteration often renders this impossible.

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TABLE OF SPELLING AND PRONUNCIATION R.G.S. II.

a	The long and short Italian vowels, as in *lāvā* ..	Somāli; Rāvennā.*
ă	Between *a* in *fat* and *e* in *eh*?; chiefly in Teutonic and Finno-Ugrian languages	Mähring; Pärnu.
ai	The two Italian vowels, frequently diphthongal, almost as in *aisle*; but pronounced *ei* and *ĕ* in Greek names..	Wadai; Shanghai.
au	The two Italian vowels; frequently diphthongal; almost as *ou* in *out*	Sakau; Bauchi.
aw	When followed by a consonant, or when terminal, as in *awl, law*	Dawna; Saginaw.
b	As in English.	
c	Not to be used, but always replaced by *k* or *s*; except in the compound *ch*, and in many conventionally-spelt words, as	Iandahar; Serang. Calcutta; Celébes.
ch	As in *church*; never *tch* or *tsch* for this sound ..	Chad; Kerch.
d‡	As in English.	
dh	Soft *th* as in *they*; a slight *d* sound sometimes preceding it in Semitic languages	Hadhramaut; Riyadh.
e	Long as in *eh*? short as in *bet*. (For the *e* sound in the French *je*, see note at end on the "neutral vowel.")	Gĕlo; Mafĕking.*
(ee)	Used for *i* (*q.v.*) only in a few conventional names	Darjeeling; Keelung.
ei	The two Italian vowels, frequently diphthongal as in *rein*, but pronounced *i* in Greek names ..	Beirut; Raheita.
(eu)	Not used as a single sound.	
f	As in English; *ph* must not be used for this sound	Mustafa; Maidan-i-Naftun.
g	Hard, as in *get, gift*: never as in *gem, gin* ..	Gedáref; Gilgit.
gh	Soft guttural, the Arabic *ghain*	Ghadames; Baghdad.
h	Used only when sounded; or in the compounds *ch, dh, gh, kh, sh, th, zh*	Ahmadabad; 'Abdullah.
i	Long as in *marine*; short as in *piano*	Fiji; Kibonde.
j	As in English; except in transcription of Chinese, where it equals *zh*, or the French *j*	Juba, Ujiji (Eng. *j*); but Jaoping (Fr. *j*).
k	As in English; hard *c* should never be used (except in conventionally-spelt words)—thus, not Corea, Cabul, but	Korea; Kabul.
kh	Hard aspirated guttural, as in the Scottish *loch* (not as in *lock*)	Khan; Sebkha.
l‡ **m** **n**‡	As in English.	

*The long and short symbols given here are merely for explanation, not for use.

‡See note at end on *Liquid Sounds*.

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ng	Has three separate sounds, as in *vanguard, finger,* and *singer*. If necessary to distinguish, a hyphen may be placed, as in *van-guard, singer-* ..	In-galla ; Bongo ; Ng-ami ; Tong-a.
ngg	May be used for the sound of *ng* as in *finger* ..	Trengganu ; Yanggang-a.
o	Long as in *both*¶ : short as in *rotund*	Kigōma ; Hŏnŏlulu.*
ŏ	As in German ; equals the French *eu* in *peu* ; or nearly the English sound in *fur*	Barköl.
(oo)	Used for *u* (*q.v.*) only in a few conventional names, chiefly Indian and Chinese	Poona ; Foochow.
oi	The two Italian vowels ; frequently diphthongal as in *oil*, but pronounced like *i* in *fit* in Greek names	Hanoi.
ŏi	The diphthong as in French *oeil* and Norwegian *hŏi*	Hŏiland.
ou	Dissyllabic, and not as French or English *ou*, except in Greek names where it has the French value	Zlatoust ; Yaroua.
ow	Used as a diphthongal combination of *ŏ* and *w* only in the romanisation of Chinese	Hankow.
p	As in English.	
ph	As in *loophole* ; not to be used for the *f*-sound, except conventionally	Chemulpho ; Haiphong.
q	Represents *only* the Arabic *qaf* and the Hebrew *qof* ; i.e. a guttural *k* (as a rule)	Qena ; Qiryath.
qu	Should never be employed to represent the sound of *kw* ; thus, not Namaqua, Quorra, but	Namakwa ; Kworra.
r	As in English ; should be distinctly pronounced.	
s‡	As English *ss* in *boss*, not as in *these* or *pleasure*	Burgos ; Masikesi.
sch	As in *discharge*	Peschanka.
sh **t‡**	} As in English.	
th	Hard *th* as in *thick*, not as in *this* (except conventionally in Fijian)	'Athlith ; Thingvellir.
u	Long as in *rude*, or as *oo* in *boot* ; short as in *pull*	Zūlū ; Rŭanda.*
ü	As in German : equals the French *u*, as in *tu* (Fr.)	Üsküdar.
v **w** **x**	} As in English.	
y	Always a consonant, as in *yard* ; it should not be used as a terminal vowel, *e* or *i* being substituted ; e.g. not Kwaly or Wady, but	Kikuyu ; Maya. Kwale ; Wadi.
z	As in *gaze*, not as in *azure*.	
zh	As the *s* in *treasure*, the *z* in *azure*, or the French *j* in *je* ; but for the sound in Chinese use *j* (*vide* note about under *j*)	Zhob.

*The long and short symbols given here are merely for explanation, not for use.
‡See note at end on *Liquid sounds*.

¶The true Italian ŏ is broader than this ; almost as in *broth* (= R.G.S. II *aw*). The letter *o* is conventionally used for this sound in certain names in Nigeria, Tonga, etc. : e.g. Oyo, Fofoa.

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NOTES.

The doubling of a vowel or a consonant is only necessary when there is a distinct repetition of the single sound, and should otherwise be avoided	Nuusafee; Moorea; Jidda; Muhammad.
Accents should not generally be employed; but in order to indicate or emphasise the stress, an acute accent may be used	Saráwak; Qántara; Tong-atábu; Paraná.
A long or short mark over a vowel (e.g. ā, ŏ) should only be used (and that sparingly) when without it there would be danger of mispronunciation ..	Kūt; Kyŏto; Abŏso.
Hyphens will not be used except to indicate pronunciation and with the particle *-i-* (in Persian, Fijian, etc.)	Ta-if; Pusht-i-Kuh; Nuku-i-Ra.

Inverted comma and apostrophe.—The inverted comma ' is employed only to represent the Arabic *'ain*, the Maltese *'ghain*, and the Hebrew *'ayin*. The apostrophe ' in foreign words indicates a liquid sound (*see* below).

Liquid sounds.—The occasional "liquid" or "palatalised" sound of *d*, *l*, *n*, *s*, *t*, etc. (as in *d'you*, *lure*, *new*, *pursue*, *tune*, etc.) is as a rule sufficiently represented by a following *y*; where, however, owing to a following consonant, or to the palatalised letter coming at the end of a word, the *y* is inapplicable, the liquid sound will be represented by an apostrophe, thus: *d'*, *l'*, *n'*, *s'*, *t'*, etc.

The "Neutral vowel."—The "indeterminate" or "neutral" vowel sound (*er*), i.e. the sound of *a* in *marine*, *e* in *often*, *i* in *stir*, *io* in *nation*, *o* in *connect*, *ou* in *curious*, *u* in *difficult*, etc., *e* in French *je*, or the often unwritten vowel (*Fat-ha*) in Arabic, etc., is represented as a rule by *a*: as in Basra, Hawiya; but sometimes by *e*, when the sound approximates more to *e* than to *a*: as Meshed, El Gezira.

(In any guide to pronunciation issued by the Permanent Committee on Geographical Names, the "neutral vowel" is represented generally by the italic *e*: occasionally also by italic *a* or *u*.)

This sound must not be confused with *e-mute*, where the *e* is not sounded at all: as in Abbeville.

Nasal vowels.—In illustrating the pronunciation of French, Portuguese, Polish, etc., nasal vowels, the nasalisation will be represented by italic *n*; as Czestochowa pr. Chā*n*stokhóva.

Note.—The Royal Geographical Society has published a book entitled "Alphabets of Foreign Languages transcribed into English according to the R.G.S. II system." This book enables the correct rendering of names to be obtained, also of names in languages which are transliterated letter for letter.

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INFORMATION RELATING TO ADMIRALTY CHARTS AND PUBLICATIONS, GENERAL NAVIGATION, AND GENERAL METEOROLOGY.

ON THE CORRECTION OF ADMIRALTY CHARTS.

Guides to Navigation.—In addition to the charts, the navigational publications which are primarily affected by the continual changes and alterations that take place are the Admiralty Sailing Directions, the Admiralty List of Lights, Fog Signals and Visual Time Signals, and the Admiralty List of Radio Signals. The Admiralty Notices to Mariners contain information mainly for the correction of the charts and navigational publications.

CHARTS.

1. Degree of Reliance.—It should be clearly understood that the value of a chart depends on the character of the original survey and on the completeness of the reports of subsequent changes. The remarks on "The Use of Charts as Navigational Aids, &c." which are subjoined should be carefully studied in this connection.

2. System of Dating and Issue of Corrected Copies.— Admiralty charts after first publication, are kept corrected by means of new editions, large corrections, and small corrections. Copies of charts issued by the Hydrographic Supplies Establishment, Admiralty Chart Agents or Admiralty Chart Depôts are corrected, except from temporary and preliminary Notices to Mariners, for all navigational information to the date of issue.

New Charts.—The date of publication of a chart is shown outside the bottom margin, in the middle, e.g. :—

Published at the Admiralty 30th May, 1947.

New Editions.—When a chart is revised throughout and modernised in style a new edition is published, the date being shown outside the bottom margin and to the right of the date of publication, e.g. :—

New Edition 2nd Jany., 1947.

All large and small corrections notations are at the same time erased, and all old copies of the charts are cancelled.

Large Corrections.—When a chart is corrected from important information which is too comprehensive to promulgate by Admiralty Notice to Mariners or to insert conveniently by hand on existing copies, but when the chart is not revised throughout, the date on which these corrections are made is shown on the chart outside the bottom margin and to the right of the date of publication, and in the case of a chart already marked with a new edition date, below such date, e.g. :—

Large corrections 10th Feb., 1947.

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All small corrections notations are at the same time erased, and all copies of the chart are cancelled.

Small corrections.—

(*i*) When a chart is corrected from the information promulgated in an Admiralty Notice to Mariners (except temporary and preliminary Notices), the year, if not already shown, and number of the notice are entered in the bottom left-hand corner of the chart, e.g. :—

Small corrections 1947–*903.*

Copies of the chart stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents and the Admiralty Chart Depôts are corrected by hand from such information.

(*ii*) When a chart is corrected from information which is considered of no importance from the standpoint of safe navigation, and which is, therefore, not promulgated in an Admiralty Notice to Mariners, the year, if not already shown, and date of the correction are entered on the chart, in one of two ways, in the bottom left-hand corner below the margin and in sequence, with the notations referred to in the preceding paragraph, e.g. :—

Small corrections, 1947—5.20—

or Small corrections 1947—(VI.*25*)

These indicate that the chart received minor corrections on the 20th May or 25th June, respectively.

In such cases copies of the chart held by ships and establishments are not usually replaced by new copies, but in exceptional cases, e.g., when new compasses are inserted, new copies of the charts may be supplied. It should, however, be particularly noted that the absence of corrections represented by square or bracket dates from a chart does not invalidate it for navigation.

3. Correction of Charts in Ships.—All small but important corrections affecting navigation that can be made to the charts by hand are promulgated in Admiralty Notices to Mariners and, with the exception of corrections from temporary or preliminary Notices, should at once be neatly made in waterproof violet ink on the charts affected, the year (if not already shown) and numbers of the notices being inserted, also in waterproof violet ink, in the bottom left-hand corner of the chart. The recognised abbreviations shown on Admiralty chart No. 5011 (" Signs and abbreviations used on Admiralty Charts ") should be used.

Generally speaking, the amount of information which should be inserted on a chart should be in accordance with that already shown.

On large scale charts, the abridged descriptions, as shown on chart No. 5011, of all details of all lights, light-buoys and fog signals, and the year dates of obstructions, reported shoals, dredged channels, depth on bars or in shifting channels, and irregularities of lights, should be inserted.

On coastal charts, the abridged descriptions of only the principal lights and fog-signals, i.e., those to assist in approaching or making the land, should be inserted.

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Particulars of such lights should be omitted, in the following order, as the scale of the chart decreases, viz. :—

(i) Elevation, (ii) Period, (iii) Number in Group, and (iv) Visibility.

Particulars of fog signals should be inserted in their appropriate positions if space permits, but should otherwise be entered in a tabulated list under the title or some other convenient place on the chart.

Inner harbour light-buoys and beacons should not be inserted on coastal charts, and against other light-buoys only the character of the light should be inserted.

On ocean charts, lights which are visible 15 miles or over should alone be inserted and then only their character and colour.

On all charts, writing should be inserted as much as possible clear of the water, unless the relative objects are on the water, and care should be taken not to obliterate any information already on the chart. When cautionary or tidal notes, &c., are inserted, they should be written in a convenient but *conspicuous* place, preferably near the title, where they will not interfere with other details.

Erasures should never be made but the details should, when necessary, be crossed through in waterproof violet ink.

Admiralty Notices to Mariners are occasionally accompanied by reproductions of portions of charts (known as " blocks "), and when correcting charts from such blocks the following points should be borne in mind :—

(i) A block may not only indicate the insertion of new information, *but also the omission of matter previously shown.* The latter would, however, invariably be mentioned in the text of the Notice, and the fact that a block accompanies a Notice should not cause the text of the Notice to be disregarded.

(ii) The limiting lines of a block are determined for convenience of reproduction and need not be adhered to when cutting out for pasting on the chart, provided that the point mentioned in the preceding paragraph is taken into consideration.

(iii) The new information shown on a block can sometimes be inserted on the chart by hand, the reason for issuing a block in such a case being to avoid a long description of the new information in the text of the Notice.

(iv) Owing to distortion the blocks do not always fit the charts exactly, care should therefore be taken when pasting a block on to a chart that the more important navigational corrections fit as closely as possible. This can best be assured by fitting the block while it is dry and making two or three pencil ticks round the edges for use as fitting marks after the paste is applied.

Corrections from Temporary or Preliminary Notices to Mariners should be inserted on the charts *in pencil* and the year and number of the notice should be shown against them, e.g. :—N.M. 625/1947 temp., and also in the bottom left-hand corner of the chart, in pencil, *below* the small corrections notations (*see* above). Temporary corrections should be rubbed out when the notice is received cancelling them, but preliminary corrections should be inked in when the notice is received reporting that the changes have been made.

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Charts stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents and the Admiralty Chart Depôts are *not* corrected from Temporary or Preliminary Notices to Mariners, and when charts are received from one of these sources they should be corrected in pencil as necessary from the copies of such Notices already held, or from those supplied with the charts.

Corrections from Radio Navigational Warnings concerning derelicts and drifting obstructions, the temporary extinction of lights, displacement of important aids to navigation, ice reports, &c., should also be noted *in pencil*, as received, on the charts affected. Radio Navigational Warnings of a permanent nature and those relating to derelicts and drifting obstructions dangerous to navigation are re-issued in the form of Admiralty Notices to Mariners, but other warnings are not re-issued in this way, except in special circumstances.

Corrections from information received from authorities other than the Admiralty should be noted, *in pencil*, on the charts affected, but no charted danger is to be expunged without the authority of the Hydrographer of the Navy.

NAVIGATIONAL PUBLICATIONS.

1. Admiralty Sailing Directions, Supplements, &c.—The Admiralty Sailing Directions, consisting of about 73 volumes for the whole world, contain general information useful to the navigator.

An index chart bound near the beginning of each volume shows the area dealt with and the serial numbers and limits of all Admiralty charts for the area which were published *when the volume was printed.*

Each volume is periodically revised throughout, and, in the intervals between the publication of new editions, Admiralty Notices to Mariners and Supplements are published to enable the volume to be corrected. It should, however, be clearly understood that Sailing Directions cannot be correct in all minor details after the date of the latest Supplement.

The above-mentioned corrections are not made in the Sailing Directions stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents or the Admiralty Chart Depôts.

A new edition of each volume of Sailing Directions is published at intervals of approximately from ten to twelve years. The number of the latest Admiralty Notice to Mariners used in its compilation is given in the "Advertisement" on page iii of each volume, and the numbers of the Notices affecting it between the dates of going to press and issue to ships and establishments are given in the Notice announcing its publication, to enable the new edition to be corrected before being brought into use.

A Supplement to each volume is generally published annually, each succeeding Supplement cancelling the former. When a volume is taken up for revision, however, no further Supplement to that edition is issued, but subsequent Notices to Mariners affecting it are summarised each year and issued as a separate publication, until the new edition of the volume is published.

A tabular form for notation of the existence of Supplements and Summaries of Notices is printed on the front fly-leaf of all Sailing Directions, and these notations are made as necessary in all copies issued by the Hydrographic Supplies Establishment and the Admiralty Chart Depôts.

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Supplements and Summaries of Admiralty Notices to Mariners should be retained intact. *Whenever reference is made to the Sailing Directions, the Supplement, and where applicable the Summary, must be consulted.* The existence of a Supplement or Summary of Admiralty Notices to Mariners is to be entered in the tabular form inside the cover of the Sailing Directions. New and amended information appearing in the Supplements for the first time is indicated by square brackets, and deletions from the previous Supplement are indicated by horizontal lines.

Admiralty Notices to Mariners affecting Sailing Directions *are not* to be cut up and pasted in, but the book is to be annotated in the margin, or corrected in manuscript, as convenient.

2. The Admiralty List of Lights, Fog Signals and Visual Time Signals.—The Admiralty List of Lights, Fog Signals and Visual Times Signals for the world is issued in twelve volumes divided geographically as shown on the index chart at the beginning of each volume.

Light-buoys are *not* included in the list.

The volumes are published annually at the rate of one volume per month commencing with Volume 1 about March and ending with Volume 12 about February. Supplements to these volumes will not be issued.

Each volume will be issued with an inscription on its cover and title page stating the date to which the volume has been corrected, which will be approximately six weeks prior to the date of its issue. Corrections or additions to each volume, which may occur between the date of correction and date of issue, will be promulgated by Section III of Admiralty Notices to Mariners.

Amendments.—Important amendments are promulgated in Admiralty Notices to Mariners. In Section III of each Weekly Complete Edition of these Notices will be found all additions and alterations made to Lights, Fog Signals and Visual Time Signals by the Notices issued during the week affected; certain other additions and alterations are also included in Section III, which, though not of sufficient importance to necessitate the issue of a Notice to Mariners, will be found of use to the seaman.

Corrections to the Light Lists should be made in pencil, or extracted from Section III and pasted in the appropriate volume.

Note.—Corrections are not made in copies of the Lists of Lights, &c., stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents or the Admiralty Chart Depôts, and copies received from these sources should accordingly be corrected from the weekly editions of the Notices to Mariners before being brought into use.

3. The Admiralty List of Radio Signals.—The Admiralty List of Radio Signals is issued in three volumes.

Volume I.—Communications—Comprises particulars of radiotelegraph coast stations, together with general regulations; it also includes such subsidiary services as medical advice supplied by radio.

Volume II.—Navigational Aids—Comprises particulars of services from direction-finding stations, radiobeacons, and radio navigational aids (position fixing systems) together with radio time signals and navigational warnings (with ice signals); all relevant codes and regulations will be found in this volume.

Volume III.—Meteorological Services—Comprises particulars of weather services provided for the use of shipping, together with relevant codes and lists of meteorological observation stations.

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New editions of each volume will normally be published annually.

All corrections subsequent to the date of publication are promulgated in Section VI of the complete weekly edition of Admiralty Notices to Mariners.

Copies of the List stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents or the Admiralty Chart Depôts are not kept corrected, and Lists received from these sources should accordingly be corrected from the weekly editions of the Admiralty Notices to Mariners before being brought into use.

4. The Admiralty Tide Tables.—The Admiralty Tide Tables are published in three sections as follows:—

For "EUROPEAN WATERS (including Mediterranean Sea)."

For "ATLANTIC AND INDIAN OCEANS."

For "PACIFIC OCEAN AND ADJACENT SEAS."

Each section contains two parts, Part I giving tidal predictions for Standard Ports and tidal stream predictions for certain straits and channels. Part II giving data for predicting tides at places which are not Standard Ports.

Admiralty Tide Tables, Part III, contains instructions for predicting tides and tidal streams, and for analysing observations of tides and tidal streams, with tables to assist prediction and analysis.

THE USE OF CHARTS AS NAVIGATIONAL AIDS AND GENERAL REMARKS RELATING TO PRACTICAL NAVIGATION.

(1) Reliance on a chart.—The value of a chart must manifestly depend upon the accuracy of the survey on which it is based, and this becomes more important the larger the scale of the chart.

To estimate this the date of the survey, which is always given in the title, is a good guide. Besides the changes that, in waters where sand or mud prevails, may have taken place since the date of the survey, the earlier surveys were mostly made under circumstances that precluded great accuracy of detail, and, until a plan founded on such a survey is tested, it should be regarded with caution. It may, indeed, be said that, except in well-frequented harbours and their approaches, no surveys yet made have been so minute in their examination of the bottom as to make it certain that all dangers have been found. The fullness or scantiness of the soundings is another method of estimating the completeness of a chart. When the soundings are sparse or unevenly distributed, it may be taken for granted that the survey was not in great detail.

It appears to be insufficiently realised that the degree of reliance which may reasonably be placed upon an Admiralty chart, even in surveys of modern date, is mainly dependent on the scale on which the survey was made. The scale for publication is now generally that of the original survey, except in the case of coast sheets which are sometimes reduced. It should not, therefore, be assumed that the original survey was made on a larger scale than that published.

It must be borne in mind that the principal method of ascertaining the inequality of the bottom of the sea is by the laborious process of sounding, and that in sounding over any area, the boat or vessel

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obtaining the soundings is kept on given lines; that each time the lead descends, or a sonic sounding is taken, the depth over only a small area is obtained, in the case of the lead, it has a diameter of only a few inches, and that consequently each line of soundings, though miles in length, is only to be considered as representing a narrow width.

Surveys are not made on uniform scales, but each survey is made on a scale commensurate with its apparent importance. For instance, a general survey of a coast which vessels only pass in proceeding from one place to another is not usually made on a scale larger than one inch to the nautical mile, while surveys of areas where vessels are likely to anchor are made on a scale of three inches to the mile, and surveys of frequented ports or harbours likely to be used by fleets, on a scale of from six inches to ten inches to the nautical mile.

Close examination by sounding is the only method by which surveys on a large scale can be made, and in view of the vast mileage of surveys yet requiring completion in the interests of navigation, it would be a waste of time to undertake large-scale coast surveys.

The scale on which a survey is to be conducted having been settled, it is manifestly superfluous to obtain more lines of soundings than can be represented on the paper. 100 soundings, which is the maximum number that can be placed with clearness on every square inch of paper, means that on a scale of one inch to the mile each sounding on the chart occupies an area representing eight acres of actual ground, whilst on a scale of six inches to the mile each sounding represents an area of a little less than a quarter of an acre, i.e., of 100 feet square.

The following diagram represents as many soundings as can be placed legibly on a square inch of paper:—

16	15	15	13	13	14	12	11	10	9
14	15	14	14	13	13	12	11	9	8
15	15	14	17	16	14	13	10	10	9
16	16	17	18	16	12	11	8_8	9	10
18	17	15	12	9	7_3	7_4	7_4	9	10
19	16	12	9	5_3	4_4	5_4	6_4	8_3	9
22	19	16	10	3_4	5_1	6_1	7_3	8_3	10
20	16	12	7_1	5_4	6_1	6_4	7_1	8_3	10
18	15	11	9	7_3	7	7_3	8_2	10	11
20	17	14	11	12	10	9	10	11	13

Little assistance in detecting excrescences on the bottom is afforded by the eye, when sounding in a boat, even in clear water, on account of the observer being within five feet of the surface; none in turbid seas. If, therefore, there is no inequality in the soundings to cause suspicion, a shoal patch between two lines may escape detection.

Thus, in a chart on a scale of one inch to the mile, an inequality of some acres in extent rising close to the surface, if it happened to be situated between two lines, might escape detection; whilst in a chart on a scale of 6 inches, inequalities as large as battleships, if lying parallel with, and between the lines of soundings, might exist without detection if they rose abruptly from an otherwise even bottom.

General coast charts should not, therefore, be looked upon as infallible, and a rocky shore should on no account be approached within the ten-fathom contour line, without taking every precaution to avoid a possible danger; and even with surveys of harbours on a scale of 6 inches to the mile vessels should avoid, if possible,

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passing over charted inequalities in the ground, as some isolated rocks are so sharp that the lead may not find the highest part. Better results can, however, be obtained by sonic sounding owing to the rapidity with which such soundings can be taken, but even this method will not find rocks unless the boat or vessel be directly over them.

Blank spaces among soundings mean that no soundings have been obtained in these spots. When the surrounding soundings are deep it may with fairness be assumed that in the blanks the water is also deep; but when they are shallow, or it can be seen from the rest of the chart that reefs or banks are present, such blanks should be regarded with suspicion.

Soundings in hair line, which are shown on the latest charts in upright figures, and on other charts in sloping figures, indicate that such soundings have been taken from smaller scale charts, an unreliable source, or adapted from old and imperfect surveys.

(2) **Fathom lines a caution.**—Except in plans of harbours that have been surveyed in detail, the six-fathom line on most Admiralty charts is to be considered as a caution or danger line against unnecessarily approaching the shore or bank within that line, on account of the possibility of the existence of undiscovered inequalities of the bottom, which nothing but an elaborate detailed survey could reveal. In general surveys of coasts or of little frequented anchorages, the necessities of navigation do not demand the great expenditure of time required for such a detailed survey. It is not contemplated that ships will approach the shore in such localities without taking special precautions.

The ten-fathom line is, on rocky shores, as before mentioned, another warning, especially for ships of deep draught.

Charts on which no fathom lines are marked must be especially regarded with caution, as it generally means that soundings were too scanty and the bottom too uneven to enable them to be drawn with accuracy.

Isolated soundings, shoaler than surrounding depths, should always be avoided as there is no knowing how closely the spot may have been examined.

(3) **Chart on largest scale always to be used.**—It sometimes happens that from press of work, only the copper plate of the larger scale chart of a particular locality can at once receive any extensive re-arrangement of coastline or sounding. This is an additional reason, besides the obvious one of the greater detail shown, why this largest scale chart should always be used for navigating.

(4) **Caution in using small-scale charts.**—In approaching the land or dangerous banks, regard must always be had to the scale of the chart used. A small error in laying down a position means only yards on a large-scale chart, whereas on a small scale the same amount of displacement means large fractions of a mile.

For the same reason bearings to near objects should be used in preference to objects farther off, although the latter may be more prominent, as a small error in bearing or in laying it down on the chart has a greater effect in misplacing the position the longer the line to be drawn.

(5) **Graduation.**—All plans are now being graduated in skeleton style before publication in order to facilitate easy reference to astronomical positions; previously published plans are also graduated as opportunity offers. The graduation is, however, of necessity often

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based upon imperfect information of a conflicting nature; for this reason, whenever an astronomical position is quoted other than approximate (i.e., when seconds are given), it is necessary to quote also the number of the particular chart from which the position has been derived.

In this connection it is pointed out that, whenever possible, a position should be transferred from one chart to another by bearing and distance from a distinguishing feature common to both, such as a point of land or a light, &c., and not by the graduation which may differ owing to one of the charts being constructed on later and more complete astronomical data than the other.

(6) **Distortion of printed charts.**—The paper on which charts are printed is, from various causes, subject to distortion, but the effect of this is seldom sufficient to affect navigation. It must not, however, be expected that accurate series of angles taken to different points will always exactly agree when carefully plotted upon the chart, especially if the lines are to objects at some distance. The larger the chart the greater the amount of this distortion.

(7) **Buoys.**—It is manifestly impossible that any reliance can be placed on buoys always maintaining their exact position. Buoys should, therefore, be regarded as warnings and not as infallible navigating marks, especially when in exposed positions; and a ship should always, when possible, be navigated by bearings of fixed objects on shore or angles between them, and not by buoys.

(8) **Light-buoys.**—The lights shown by light-buoys cannot be implicitly relied on, as, if occulting or flashing, the apparatus may get out of order, or the light may be altogether extinguished. These lights in the British isles are from 5 to 217 candle-power.

(9) **Cable-buoys.**—Cable-buoys marking the ends of submarine cables usually are spherical or can-shaped, surmounted by a globe and occasionally a flag. Below the topmark two *white fixed* lights, disposed horizontally, may be exhibited, but they cannot be implicitly relied on.

(10) **Lights.**—Arcs drawn on charts round a light are not intended to give information as to the distance at which it can be seen, but solely to indicate, in the case of lights which do not show the same characteristics or colours in all directions, the bearings between which the differences occur.

All the distances given in the Admiralty List of Lights and on the charts for the visibility of lights are calculated for a height of an observer's eye of 15 feet. The table of distances visible due to elevation, at the beginning of each volume of the Admiralty List of Lights, affords a means of ascertaining how much more or less the light is visible should the height of the eye be more or less. The glare of a powerful light is often seen far beyond the limit of visibility of the actual rays of the light, but this must not be confounded with the true range. Again, refraction may often cause a light to be seen farther than under ordinary circumstances.

When looking out for a light at night, the fact is often forgotten that from aloft the range of vision is much increased. By noting a star immediately over the light a very correct bearing may be afterwards obtained from the compass.

The intrinsic power of a light should always be considered when expecting to make it in thick weather. A weak light is easily obscured by haze, and no dependence can be placed on its being seen.

The power of a light can be estimated by remarking its candle

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power, as given in the Admiralty List of Lights, and in some cases by noting how much its visibility in clear weather falls short of the range due to the elevation at which it is placed. Thus, a light standing 200 feet above the sea, and only recorded as visible at 10 miles in clear weather, is manifestly of little brilliancy, as its elevation would permit it to be seen over 20 miles, if of any power. (*See* table in the Admiralty List of Lights.)

The distance from a light cannot be estimated either by its brilliancy or its dimness.

On first making a light from the bridge, by at once lowering the eye several feet and noting whether the light is made to dip it may be determined whether the vessel is in the circle of visibility corresponding with the usual height of the eye or unexpectedly nearer the light.

(11) **Fog signals.**—Sound is conveyed in a very capricious way through the atmosphere. The following points in regard to fog signals should be borne in mind:—

(*a*) Fog signals are heard at greatly varying distances.

(*b*) Under certain conditions of atmosphere, when an air fog signal is a combination of high and low tones one of the notes may be inaudible.

(*c*) There are occasionally areas around a fog signal in which it is wholly inaudible.

(*d*) A fog may exist a short distance from a station and not be observable from it, so that the signal may not be sounded.

(*e*) Some fog signals cannot be started at a moment's notice after signs of fog have been observed.

Mariners are therefore warned that fog signals cannot be implicitly relied upon, and that *the practice of sounding should never be neglected.* Particular attention should be given to placing "Look-out men" in positions in which the noises in the ship are least likely to interfere with the hearing of the sound of an air fog signal; as experience shows that, though such a signal may not be heard from the deck or bridge when the engines are moving, it may be heard when the ship is stopped, or from a quiet position. It may sometimes be heard from aloft though not on deck.

Great assistance may be obtained from radio beacons at many important lighthouses and light-vessels, but the attention of Mariners is called to the serious dangers which may arise from their misuse. No attempt should be made to approach such a position on a radio bearing, whilst relying only on hearing the sound fog signal in sufficient time to alter course to avoid danger. When the radio fog signal is transmitted from a light-vessel, it is essential in order to avoid collision, that the bearing from the light-vessel should not be kept constant.

(12) **Tides.**—In navigating coastal waters where the range of the tide is considerable, caution is always necessary. The tidal predictions for Standard ports in the Admiralty Tide Tables can generally be relied upon to give the times of high and low water to within a few minutes, and heights within a few tenths of a foot. Larger errors are to be expected in the predictions for places which are not Standard ports, computed from the data in Part II, but such predictions computed from the harmonic constants are always sufficiently accurate for the general requirements of navigation. For Standard ports the heights of the tide at times between high and low water may usually be found within narrow limits in accordance with the instructions in Parts I and III of the Tide Tables.

The datums of Admiralty charts depending on Admiralty surveys

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vary with the type of tide, but usually conform with the International agreement, that datum should be " a plane so low that the tide will but seldom fall below it." The datums used by different nations, however, differ very considerably and those of Admiralty charts depending on foreign surveys are always those used by the original surveyors, which vary from " lowest possible low water " to " mean low water " in tidal waters, and are usually mean sea level in non-tidal waters.

The datum used is always stated on large-scale Admiralty charts.

Caution.—Most datums are above the lowest level to which the tide may fall; the charts therefore do not always show minimum depths.

(13) Tidal streams.—Where the tidal streams are semi-diurnal information regarding them is usually given, in a convenient part of the chart, in tabular form or by notes, special symbols being inserted at the positions to which the information refers. In certain cases, where the information available is incomplete, the streams are indicated by means of arrows.

There are many places where the tidal streams cannot be predicted by reference to the tide at a Standard port. Although no data for predicting the times at which they flow is given, their general direction is, in many cases, indicated by arrows on the charts. For a few of the straits and channels, where these conditions exist, tidal stream predictions are given in Admiralty Tide Tables.

Tidal streams, particularly if rotary, may vary considerably both in direction and rate; predictions of the stream must therefore always be considered approximate.

The turn of the tidal stream is not usually coincident with the times of high and low water; in fact, though in estuaries, harbour entrances, &c., the stream usually turns at about the times of high and low water, in open channels, and along open coasts generally, the turn usually occurs more nearly at half-tide. Predictions of the times of high and low water must therefore never be used as predictions of the times of slack water.

It should be remembered that, even where the general direction of the stream is parallel with the shore, an indraught is usually experienced when crossing the entrances to bays and inlets.

(14) Fixing positions.—For further information on this subject, *see* Admiralty Manual of Navigation.

When in sight of land, every opportunity should be taken of fixing the ship's position by terrestrial objects.

(*a*) *Simultaneous bearings or angles.*—The most usual method is by compass bearings of suitable objects, and it must be borne in mind that a fix by only two bearings is liable to error, either an absolute error in taking the bearings, or those made in applying the deviation or in laying the bearings off on the chart. For these reasons, a third or check bearing of some other object should, when possible, be taken, especially when near the shore or dangers. The coincidence of the resulting three lines will prevent any mistakes if the objects are suitably placed.

The position may also be fixed by observing horizontal sextant angles of well-defined suitably placed objects. These angles may be plotted on the chart with a station-pointer. Two conditions are, however, necessary to its successful employment; first, that the objects be well chosen; and, second, that the observer is skilful and rapid in his use of the sextant and station-pointer. For the former, reference can be made to the pamphlet on the use of the station-pointer,

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or to the Admiralty Manual of Navigation; the latter is only to be obtained by practice.

It will readily be seen that a sextant often offers advantages, as angles can be obtained from any position whence the objects are visible, and the fix is in no way dependent on the compass.

In many narrow waters also, where the objects may yet be at some distance, as in coral harbours or narrow passages among mud banks, navigation by sextant and station-pointer is invaluable, as a true position can only be obtained by its means. A small error in either taking or plotting a bearing under such circumstances may put the ship ashore.

In all cases where great accuracy of position is required, such as the fixing of a rock or shoal, or the addition to a chart of fresh soundings or new buildings, angles should invariably be used. In such cases angles should be taken of a number of objects, five being a good number, since this not only fixes the position beyond doubt, but also affords a useful check on the accuracy of the chart itself. When running a line of soundings it is only necessary to take a third angle every now and then, firstly to make certain that the more important soundings, as at the end of a line, are correctly placed, and secondly to check the general accuracy of the chart.

Sometimes when only one of the selected objects is visible from the compass, a compass bearing of it and a sextant angle to the other may be used to fix the position.

(*b*) *Simultaneous bearing and distance.*—Attention is also directed to the very useful and handy method of fixing by the bearing and distance of a suitable object.

Should the ship be supplied with ranging equipment, its use here is obvious, but without it a very good approximate distance of an object of known height may be obtained by observing its angle of elevation and obtaining its distance from Lecky's Offshore Distance Tables, which are supplied with all sets of charts. Full directions for the use of these Tables are given with them.

(*c*) *The running fix.*—If two position lines are obtained at different times the position of the ship may be found by transferring the first position line up to the time of taking the bearing for the second position line. The point of intersection of the second and the transferred position line is the ship's position at the time of the second observation.

The accuracy of this fix will depend on the accuracy of the estimated run (over the ground) between bearings and, therefore, it is essential to take great care that an accurate allowance is made for tidal stream, current, and leeway experienced by the ship during this interval.

The method of fixing by doubling the angle on the bow is useful when passing points of land, &c., in waters where there is either no tidal stream or current, or where this can be estimated with sufficient accuracy.

This method is as follows:—

Suppose that the angle between the ship's head and an object is measured, and found to be X°, and that the time of the observation is noted. Suppose also that the time is again taken when the angle between the ship's head and the object is 2X°. Then, if the course made good is the course steered, the distance of the ship from the object at the time the second bearing was taken is equal to the run (over the ground) in the interval. Hence the ship's position can at once be laid off as a bearing and distance from the object. In practice the angle X should not be less than about 25°.

The most usual form of this method, the so-called "four-point"

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bearing, gives a good fix for a departure, but does not ensure safety, as the point and any dangers that may lie off are abeam before the position is obtained.

The above fix is reliable when there is no tidal stream or current or when it runs directly with or against the course of the ship. When the stream or current runs across the course of the ship or when leeway is to be allowed for, this method should never be used and the ship's position should be obtained by plotting the two bearings as a running fix.

A table "Distance of an object by two bearings" is supplied with certain chart folios, and is also given in Inman's Tables, by which the ship's position at the second bearing can be found: any two bearings at a suitable angle to each other may be used, together with the run between them, but, again, this table should not be used when the vessel is subject to a cross tidal stream or leeway.

(*d*) *The danger angle.*—The use of the danger angle in passing outlying dangers with land behind them should also not be forgotten.

A vertical danger angle is useful when the danger lies off an object such as a lighthouse, the height of which is known; the angle being obtained from the aforesaid Lecky's Tables. If a horizontal danger angle between two objects is used, however, caution is necessary, as, should the objects not be correctly placed on the chart, the angle taken from it may not serve the purpose. This method should not, therefore, be employed when the survey is old or manifestly imperfect.

(*e*) *The astronomical position line.*—When fixing by astronomical observations, attention is drawn to the great utility of the position line. Even a single position line may at times give invaluable information, as the ship must be somewhere on this line, provided that the chronometer error is accurately known.

A sounding obtained at the same time may often serve to give an approximate position. Again, by steering along, or at a required distance parallel to, a single position line, a vessel may make her port or avoid a danger, although uncertain of her position.

A very accurate position may be obtained by observations of three or more stars at evening or morning twilight, or by the observation of a bright star at daybreak and another shortly afterwards of the sun when a few degrees (not less than 10°) above the horizon. The position lines obtained from the bodies observed should differ in azimuth by 30° or more.

Mariners are also reminded that, with modern tables for correcting the altitude, observations of the moon entail practically no more calculation than those of a planet. Moon sights are sometimes available when stars are obscured by light cloud, &c.; also, an excellent position may frequently be obtained by simultaneous observations of the sun and moon.

(*f*) *The radio position line.*—A number of radio systems of which the principal ones are M/F D/F, Radio Beacons, Consol Beacons, Loran, Gee and Decca, are now in general use from which position lines or fixes may be obtained.

The accuracy and range which may be obtained from these systems vary considerably; their great advantage over other methods lies in the fact that they can be employed under all weather and visibility conditions, though in some cases the results obtained will vary between day and night.

Special receiving equipment is generally required in order to make

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use of the radio signal, and some systems require special lattice charts or tables for plotting the position lines. Full details of these systems and their coverage areas are contained in Admiralty List of Radio Signals, Volume II.

The mariner should appreciate that with the position-fixing systems the accuracy of a fix will depend on three factors :—

(i) The distance of the observer from the transmitters.

(ii) The bearing of the observer from the base line joining the pair of stations which he is using.

(iii) The angle of intersection of the hyperbolic position lines.

It should be apparent from the inspection of any lattice chart that an inherent small equipment error, or a small personal error that may occur at the receiver, will cause a geographical error of varying amount according to the observer's position.

It is important to realise that accurate equipment is no guard against the vagaries of the propagation of radio waves. The beacons and systems operating on medium and low frequencies are liable to " night error " in areas where the ground and sky waves are received with equal strength ; these areas will occur at ranges depending upon the particular frequency used by any beacon or system. Where the transmissions of two stations are synchronised to provide one signal reading and position line, " night error " will be a minimum along the normal to the base line joining the pair of stations, and a maximum towards the limits of their service sector.

Little is yet known about the effects of hills and discontinuities in the terrain (such as cliffs) on the speed of medium- and low-frequency radio waves.

At the other end of the radio spectrum the transmissions of systems operating on the very high frequencies are subject to distortion in abnormal atmospheric conditions.

(*g*) ***Fixing by radar.***—Radar may also be of considerable assistance when navigating in coastal waters in low visibility or at night. It is essential, however, to appreciate the limitations of a radar set when interpreting the information obtained from it. It must be remembered that the radar horizon is only slightly farther than the visual horizon would be, in good visibility, for a height of eye equal to the height of the radar aerial. Hence no echoes will be received from a coastline lying below the radar horizon, while echoes may be received from high ground farther inland which will give a misleading impression of the range of the nearest land.

Depending on the width of its beam, the bearings from a radar set tend to be inaccurate. It is therefore preferable when fixing by radar to use ranges rather than bearings. It is then most important to consider carefully the identity of the object giving the echo, using the bearing as an indication, and the height of the object to determine whether it will appear on the radar presentation. Radar Range Nomograms are useful in deciding this, but a satisfactory result can be obtained by using " Distance to Sea Horizon Tables."

When two or more objects on the radar presentation have been selected and positively identified, a satisfactory fix can be obtained by striking arcs on the chart with the radar range of the selected objects. These arcs intercept at the ship's position. Best results will be obtained by using isolated objects such as detached lighthouses, rocky islets, and the extremities of long piers or jetties, but where no such objects are available a steep coastline with cliffs should be used. Flat or gently shelving coastlines, such as mud flats or sand dunes,

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should not be used since it is difficult to identify any portion of them on the radar presentation. Identification is assisted in some areas by fitting objects, such as buoys and beacons, with radar reflectors, causing them to return strong echoes. Attention is drawn to the symbols with which such objects are marked on Admiralty Charts, and which are given in the latest edition of Chart No. 5011, "Explanation of signs and abbreviations used on Admiralty Charts."

The difficulty of positive identification of objects is largely reduced if a Chart Comparison Unit is used in conjunction with the navigational radar. Fixes obtained with this equipment employ, in principle, an infinite number of ranges of the terrain in the vicinity of the ship, and in so doing a satisfactory fix will normally be assured.

In addition, radar beacons are available in some areas. Details of these and their use are given in the Admiralty List of Radio Signals, Volume II.

(15) Observations for errors of the compass.—No opportunity should be neglected for checking the error of the compass. When coasting, and a well-surveyed and fairly large-scale chart is available, an excellent method of observing the error is by taking the compass bearing of two suitable objects when in transit, and comparing this with the charted bearing; there should be sufficient distance between the objects to provide a sensitive transit. When this method is not available the error should be obtained by azimuths of a heavenly body. Errors should be observed on any change of course on which the ship is steadied for a reasonable time, and at least twice a day when steering a steady course for long periods.

(16) Change of variation of the compass.—The gradual change in the variation must not be forgotten in laying down positions by bearing on charts. The magnetic compasses placed on the charts for the purpose of facilitating plotting become in time slightly in error, and in some cases, such as with small scales, or when the lines are long, the displacement of position from neglect of this change may be of importance. The compasses are re-engraved when the error amounts to a degree, but the chart plates cannot be corrected more frequently from the impossibility of making alterations often on one spot in a copper plate.

The geographical change in the variation is in some parts of the world sufficiently rapid to need consideration. For instance, in approaching Halifax from Newfoundland the variation changes 10° in less than 500 miles, and in the English channel about 5° in 400 miles. The Variation chart should be consulted on this head.

On certain general charts embracing large areas with considerable change of variation, true compasses are placed instead of magnetic compasses, the variation being shown by *isogonic lines* (curves of equal magnetic variation), in a similar manner to the Variation chart. One or two *isogonic lines* are also sometimes placed on charts, in addition to the magnetic compasses, in order to indicate the general direction of these curves, and thus facilitate the determination of the variation to be employed in portions of the chart not in immediate proximity to any one of the engraved compasses. Magnetic variation values shown on Admiralty charts are for the 1st July of the year mentioned.

(17) Local magnetic disturbance of the compass on board ship.—The term "local magnetic disturbance" has reference only to the effects on the compass of magnetic masses external to the ship in which it is placed. Observation shows that such disturbance of the

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compass in a ship afloat is experienced only in a few places on the globe. Magnetic laws do not permit of the supposition that it is the visible land which causes such disturbance, because the effect of a magnetic force diminishes in such a rapid proportion as the distance from it increases that it would require a local centre of magnetic force of an amount absolutely unknown to affect a compass half a mile distant.

Such deflections of the compass are due to magnetic ores in the bed of the sea under the ship, and when the water is shallow, and the force strong, the compass may be temporarily deflected when passing over such a spot, but the area of disturbance will be small, unless there are many centres near together. Such areas are depicted by a special symbol on charts, and the cause of the magnetic disturbance is referred to as a Local Magnetic Anomaly.

They may also be due to wrecks lying on the bottom in moderate depths, but investigations have proved that, while deflections of unpredictable amount may be expected when very close to such wrecks, it is unlikely that deflections in excess of 7° will be experienced, nor should the disturbance be felt beyond a distance of 250 yards.

It is very desirable that whenever a ship passes over an area of local magnetic disturbance, the position should be fixed, and the facts reported as far as they can be ascertained.

(18) Use of oil for modifying the effect of breaking waves.—Many experiences of late years have shown that the utility of oil for this purpose is undoubted, and the application simple.

The following may serve for the guidance of seamen, whose attention is called to the fact that a very small quantity of oil, skilfully applied, may prevent much damage both to ships (especially the smaller classes) and to boats, by modifying the action of breaking seas.

The principal facts as to the use of oil are as follows:—

1. On free waves, i.e., waves in deep water, the effect is greatest.

2. In a surf, or waves breaking on a bar, where a mass of liquid is in actual motion in shallow water, the effect of the oil is uncertain, as nothing can prevent the larger waves from breaking under such circumstances; but even here it is of some service.

3. The heaviest and thickest oils are most effectual. Refined kerosene is of little use; crude petroleum is serviceable when nothing else is obtainable; but all animal and vegetable oils, such as waste oil from the engines, have great effect.

4. A small quantity of oil suffices, if applied in such a manner as to spread to windward.

5. It is useful in a ship or boat, both when running, or lying to, or in wearing.

6. No experiences are related of its use when hoisting a boat up in a sea-way at sea, but it is highly probable that much time and injury to the boat would be saved by its application on such occasions.

At anchor, when the sea is sufficient to render it difficult to hoist up or in boats, oil bags from forward or from the swinging booms have been found to render the sea alongside comparatively smooth.

7. In cold water, the oil, being thickened by the lower temperature, and not being able to spread freely, will have its effect much reduced. This will vary with the description of oil used.

8. The best method of application in a ship at sea appears to be: hanging over the side, in such a manner as to be in the water, small canvas bags, capable of holding from one to two gallons of oil, such bags being pricked with a sail needle to facilitate leakage of the oil.

The position of these bags should vary with the circumstances.

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Running before the wind they should be hung on either bow and allowed to tow in the water.

With the wind on the quarter the effect seems to be less than in any other position, as the oil goes astern while the waves come up on the quarter.

Lying to, the weather bow and another position farther aft seem the best places from which to hang the bags, with a sufficient length of line to permit them to draw to windward, while the ship drifts.

9. Crossing a bar with a flood tide, oil poured overboard and allowed to float in ahead of the boat, which would follow with a bag towing astern, would appear to be the best plan. As before remarked, under these circumstances the effect cannot be so much trusted.

On a bar with the ebb tide it would seem to be useless to try oil for the purpose of entering.

10. For boarding a wreck, it is recommended to pour oil overboard to windward of her before going alongside. The effect in this case must greatly depend upon the set of the current, and the depth of the water.

11. For a boat riding in bad weather from a sea anchor, it is recommended to fasten the bag to an endless line rove through a block on the sea anchor, by which means the oil is diffused well ahead of the boat, and the bag can be readily hauled on board for refilling if necessary.

12. Towing a vessel in a heavy sea, oil is of the greatest service, and may prevent parting the hawser. Distribute from the towing vessel forward and on both sides; if used only aft the tow alone gets the benefit.

(19) **Mirage and abnormal refraction.**—An unusual lapse rate of temperature (and therefore density as well) with height immediately above the sea (or land) surface produces a distortion in the appearance of objects near the horizon; such a phenomenon is known as mirage.

When the surface is relatively cold (and the wind very light) so that the density of the air decreases rapidly for a short distance above the surface, light rays from objects low down near the horizon are bent down, the same way in fact as are usually the rays of the sun when entering the earth's atmosphere at a low altitude. The effect is to render visible objects that are normally below the horizon, e.g., lights may be "raised" at night at much greater distances than one would ordinarily expect. This phenomenon is known as "looming."

A further occasional effect produced when the air is appreciably warmer than the sea, is "superior mirage" in which an inverted image is seen over the real object; sometimes an erect image is seen immediately above and touching the inverted one. The object and its images in this instance are well defined in contrast to the shimmering object and image of the inferior mirage. Superior mirage is most often experienced in high latitudes and wherever the sea surface temperature is abnormally low.

"Inferior mirage," the effect of which is to decrease the distance at which objects are visible in a horizontal direction, is due to a rapid increase of density with height close to the surface such as occurs when air of comparatively low temperature blows over a warmer sea, or over a tarred road or desert when a hot sun is beating down on it. In either event light rays are bent up when approaching the surface where the density of the air is much less than above. The coastline, and at times a ship or island, may appear to be floating in air above a shimmering horizon, possibly with, in the former instance, her hull

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either invisible or with an inverted image underneath. Inferior mirage is comparatively uncommon at sea and is more likely to be observed along a coastline than well out to sea.

When mirage is evident caution must be used in taking sights with a sextant, for abnormal refraction must necessarily be present also. With inferior mirage better, but not normal, results will usually be obtained by ascending as high as possible in the ship; with superior mirage the height of eye should be as low as possible. It is, however, advisable, whenever abnormal refraction is suspected, to measure the elevation of the celestial body above the back as well as the front horizon as explained in navigational text-books.

(20) Aurora.—The most common form of aurora is an arc system, single or multiple, narrow and well defined, or broad and diffuse, and centred on the magnetic meridian.

The most usual colour is pale whitish green when the auroral activity is weak and diffuse: but when the aurora arises high towards the zenith in the form of rays, rayed curtains and draperies with much rapid movement of the constituent rays, the colours sometimes become much stronger and more vivid, and include bright green, red and violet. When the curtains forming the aurora converge to form a corona, which may rotate very rapidly about the point of convergence, the displays may become very complex, filling practically the whole sky, and extending far to the equatorial side of the zenith with much rapid movement and change of colour from instant to instant.

Though the most usual duration of auroral displays in these high latitudes is several hours, they not infrequently last throughout the whole night from dusk to dawn. In such long displays the really intense and violently active periods with vivid strong colours are generally confined to spasms of 15–30 minutes, with the intervening periods filled with diffuse glows or quiet arc systems.

The absolute intensity of the light of the aurora is seldom great, and the brighter stars usually glimmer through it. In the most vivid and intense displays, the light may equal, but rarely surpasses, that of the full moon in a cloudless sky. It may give enough light to read by. On such occasions the aurora may be visible to some extent in partial twilight.

Though in high latitudes aurora occurs any time in the dark hours it is probably most frequent in the late evening hours from 9 p.m. till midnight or just after; it is more frequent in the equinoctial months than at other times and has a well-defined 11-year period of activity following the cycle of solar activity. A maximum of activity occurred in 1948, and the interval from maximum to minimum activity usually occupies a period of about 6 to 7 years. In high latitudes this cycle of activity is reflected more in the intensity and vividness of the displays than in their frequency of occurrence. Though really outstanding displays tend to occur around the years of maximum activity they may occur at any time of the cycle, except perhaps near the absolute minimum.

In addition to this 11-year cycle of activity active periods tend to recur at intervals of 27 days, *see* Magnetic Storms.

Northern hemisphere.—Aurora Borealis occurs most frequently along a zone which forms an approximate oval, of average radius 23°, with centre in the extreme north-west of Greenland. This zone of maximum frequency crosses Hudson Bay and the Labrador coast in about lat. 58° N. It runs south of Cape Farewell and along the south coast of Iceland. It lies just north of North Cape, touches the extreme north

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of Novaya Zemlya, skirts Cape Chelyuskin and then eastward just north of Wrangel Island into the north of Alaska. Along this zone aurora of some kind can probably be seen every suitable night when the sky is clear; 250 miles outside this maximum zone to the southward the auroral frequency decreases sharply to about 70–100 nights a year on the average, and to 20–25 nights 500 miles south of the maximum zone. Inside the maximum zone the geographical distribution of frequency is not so well established but it probably falls off more gradually than it does outside.

On the zone of maximum frequency itself aurora appears as frequently to the south of the zenith as to the north, but with increasing distance outside the zone the appearances concentrate more into the northern sky; the reverse is true inside the zone.

Southern hemisphere.—The frequency and distribution of Aurora Australis is not fully known. It is probable that it is more frequently seen at sea between about long. 50° E. and 175° W. than in other longitudes. Very fine displays have occasionally been seen in Australasia and on passages across the Southern Ocean. There is nevertheless a general impression that aurora is less frequent in the southern than in the northern hemisphere. This is probably to be accounted for by the fact that, apart from whaling and exploring expeditions, ships' tracks in general do not extend to such high latitudes as in the northern hemisphere.

The zone of maximum auroral frequency is roughly annular and is near the circumference of a circle of radius about 1,080 miles, centred in about lat. 75° S., long. 129° E. The frequency falls off both outside and inside this zone. A large part of the zone is within the continent of Antarctica.

(21) **Magnetic storms.**—Magnetic storms vary in intensity and frequency with the sunspot cycle, similarly to aurorae. An intense magnetic storm is always accompanied by a bright and active aurora. The deeply coloured aurorae, showing more pronounced red and green, and sometimes also blue and violet, tints, are invariably connected with magnetic storms of considerable or great intensity. Such a storm will produce simultaneous aurora in both hemispheres. In the greatest storms aurorae in some form may be visible down to about 20° north latitude in certain parts of the oceans, especially between the meridians of 30° W. and 140° W. Magnetic storms vary greatly in duration from a few minutes to several days; they are generally more intense during the hours of darkness. Long-continued storms usually show great fluctuations with periods of complete or partial quiescence. Similarly the associated aurora fluctuates between active and quiescent forms.

The origin of magnetic storms and aurorae is not yet fully understood, but they are intimately connected with the state of a local area of the sun. As the same part of the sun is again presented to the earth after an interval of about 27 days, a magnetic storm and aurora may recur at this time, usually in less intense form.

A ship's compass may tend to deviate during the progress of a considerable magnetic storm. In more intense storms the compass needle may oscillate 1° or more either side of its normal position. Such oscillation may persist for as long as 10 or 20 minutes before dying out. Further oscillation may occur after a period of quiescence. Deviations of 2° or more are rare, but during the great magnetic storm and aurora of January 25th, 1938, one of 4° to the eastward was observed off the Portuguese coast. During a severe magnetic

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storm the compass may be deflected continually in one direction to the extent of about half a degree for some hours. When bright aurora is seen, especially if it is of the more deeply coloured and rapidly moving kind, and particularly when it is observed in low latitudes, the possibility of deflections of the compass should always be borne in mind.

During a considerable magnetic storm freak wireless reception may occur on certain waves and short-wave transmission may fade to complete silence. Beam radio communication, especially in a west-east or east-west direction, may be interrupted. Such conditions may last in some degree over a period of several days, at times when the sun is unusually active. Short-wave fading also occurs occasionally from a different form of solar disturbance known as a " bright eruption," when this is very intense. On the average such fading begins about 7 minutes after occurrence of the bright eruption and may last 5 or 10 minutes, gradually returning to normal within a period of 40 to 45 minutes. These fadings are confined to the daylight hemisphere of the earth, while the magnetic storm fadings may occur by day or by night.

GENERAL METEOROLOGY.

(All the following articles do not apply to every Pilot, but articles applicable to this Pilot will be referred to in the Climate and Weather Section in Chapter I.)

(1) Lows.—A low, or depression, appears on a synoptic chart as a series of isobars roughly circular or oval in shape, surrounding an area of low pressure. It is a main feature of the weather at sea in middle latitudes where it is responsible for most of the occasions of strong winds and unsettled weather, though not all depressions are accompanied by strong winds.

Lows vary very much in size and depth ; one may be only a hundred miles in diameter and another over two thousand miles ; some are deeper than others, a deep low being one in which the pressure is very much lower near the centre than on the outside whereas, on the other hand, a shallow depression is one where the pressure, although low near the centre, is not very much lower than in the surrounding districts.

Note.—The bracketed equivalents hereunder refer to the Southern Hemisphere.

In the northern (southern) hemisphere the winds blow round an area of low pressure in an anti-clockwise (clockwise) direction ; there is also a slight inclination across the isobars towards the lower pressure. Thus the well-known rule for the northern (southern) hemisphere is that when an observer faces the wind the direction of the lowest pressure is from 8 to 12 points to his right (left). The strength of the wind is in all instances closely related to the steepness of the barometric gradient or distance apart of the isobars ; the closer the isobars the stronger the wind.

Lows may move in almost any direction, though most often towards north-east (south-east) or east, at a speed of anything between 10 and 40 knots, though occasionally as much as 60, during the middle and most active stage of their existence ; they slow down when filling up (*see* " occlusion " below). The life of a low is in the region of 4 to 6 days.

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There are usually one or more fronts, probably radiating from the centre, in the area covered by a low; each front on a synoptic chart represents a belt of relatively bad weather, accompanied by a veer (backing) of wind, which marks the change from the weather characteristic of one air mass to that of another. During the first two or three days of its life a low has a warm and a cold front, the area between the two being known as a warm sector because the air has come from a warmer locality than that which is outside the sector (*see* Fig. 1*a*). Warm air is lighter than cold air and it rises over the cold air ahead of the warm front as shown in Fig. 1*b*; this causes condensation of the water vapour in the warm air, forming at first cloud and later drizzle or continuous steady rain. The cloud spreads out ahead of the warm front, and the highest cloud, cirrus or mares' tails, is often about 500 miles ahead. At the rear boundary of the warm sector, known as the "cold front," the cold air is pushing under the warm air forcing the latter to ascend rapidly; this process is sometimes violent enough to produce squalls. The rapid ascent of the warm air causes the moisture to condense in the form of cumulo-nimbus clouds (shower clouds), from which heavy showers may fall. The cold front gradually overtakes the warm front so that the warm sector is eventually lifted up from the earth's surface. When this has occurred the low is said to be occluded, and the warm and cold fronts have merged into the third type of front known as an "occlusion" (*see* Figs. 2*a* and *b*). When a low has become occluded, it usually decreases in intensity and rate of travel, and gradually fills up. On the other hand, a low which has a marked warm sector is likely to be deepening, the winds associated with it may increase in force and its rate of travel may increase. Lows are usually travelling in a direction approximately parallel to the isobars (and in the direction of the wind) in the warm sector.

The approach of a low is indicated by a falling barometer. In the northern (southern) hemisphere, if the low is approaching from westward and passing northward (southward) of the ship, clouds appear on the western horizon, the wind shifts to a south-westerly (north-westerly) or southerly (northerly) direction and freshens, the cloud layer gradually lowers, and finally drizzle, rain or snow begins. If the low is not occluded, after a period of continuous rain or snow there is a veer (backing) of wind at the warm front, a rise of temperature and diminution or cessation of rain (or snow) in the warm sector, the visibility being usually moderate and the sky overcast with low cloud. The passage of the cold front is marked by the approach from westward of a thick bank of cloud (which however cannot often be seen because of the customary low overcast sky in the warm sector), a further veer (backing) of wind to west or north-west (south-west), sometimes with a sudden squall, rising pressure, a fall of temperature, squally showers of rain, hail or snow, and improved visibility (except during showers). The squally showery weather with a further veer (backing) of wind and drop in temperature may recur while the low recedes owing to the passage of another cold front or occlusion. If the low is occluded, the occlusion is preceded by the cloud of the warm front; there may be a period of continuous rain mainly in front of and at the line of occlusion, or a shorter period of heavy rain mainly behind the occlusion, according as the air in front of the occlusion is colder or warmer than that behind it. There may be a sudden veer (backing) of wind at the occlusion.

Often another low follows 12 to 24 hours later, in which event the

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barometer begins to fall again and the wind backs towards south-west (north-west), or even south (north).

If a low travelling eastward or north-eastward (south-eastward) is passing southward (northward) of the ship, the winds in front of it are easterly and they back (veer) through north-east (south-east) to north (south) or north-west (south-west); changes of direction are not likely to be so sudden as on the southern (northern) side of the low. In the rain area there is often a long period of continuous rain and unpleasant thick weather with low cloud. In winter in the colder regions the weather is cold and raw and precipitation is often in the form of snow.

Near the region of lowest pressure, lulls are sometimes experienced, but sudden changes are likely, and in a deep low the wind may increase in strength very rapidly, perhaps to gale force as the barometer begins to rise.

Sometimes in the air circulation of a large low, usually on the equatorial side and often on a cold front, a secondary depression develops, travelling in the same direction as the primary but usually more rapidly. The secondary often deepens while the original low decreases in intensity. In the region between the primary and the secondary depressions, the winds are not as a rule strong; but on the further side of the secondary, usually the southern (northern) side, winds are likely to be strong and they may reach gale force. Thus the development of a secondary may cause gales at a greater distance from the primary than anticipated, while there may be only light winds where gales were expected.

The above is a brief general description of lows and the associated weather in temperate or middle latitudes of the northern (southern) hemisphere. It must be emphasised, however, that individual lows in different localities differ considerably from one another, according to the characteristics (especially the temperature and humidity) of the air currents of which they are composed, and the nature of the surface over which they are travelling.

(2) **Tropical revolving storms.**—*Practical rules for avoiding them.*—These storms are so named because the wind blows round an area in which the lowest pressure is at the centre. The direction of rotation is anti-clockwise in the northern hemisphere and clockwise in the southern hemisphere. The wind does not revolve round the centre of low pressure in concentric circles but has a spiral movement inwards, towards the centre of the storm field.

A tropical storm is not so extensive as the depression of higher latitudes but, within 75 miles or so of the centre, the wind is often far more violent, and the high and confused seas near the centre may cause considerable damage to large and well-found ships, while small vessels (for example, destroyers) have foundered. The danger is still greater when ships are caught in restricted waters without adequate room to manœuvre. Within 5 to 10 miles of the centre the wind is light or moderate and variable, the sky is clear or partially so, and there is a heavy, sometimes mountainous, confused swell; this area is known as the "eye" of the storm. After passing through the relatively windless centre of the storm the wind will suddenly, and with great violence, commence to blow from a direction almost opposite to that experienced on the other side of the windless centre. Due to torrential rain and sheets of almost continuous spray, visibility near the storm centre (but outside the "eye") is almost nil.

Every ship navigating in an area subject to tropical storms during

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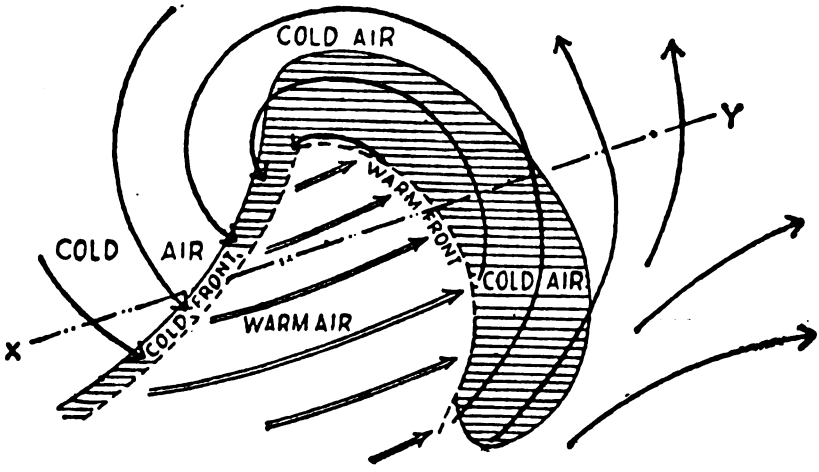
Fig. 1a.



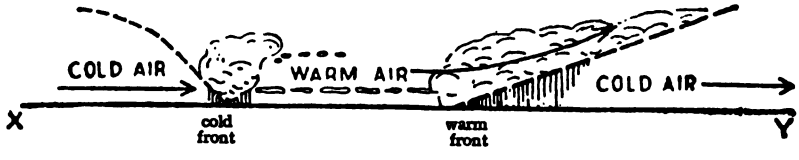
Plan of a developed depression.

The double lines show the flow of the warm air, and the single lines the flow of the cold air.

The shading shows the areas where rain (or snow) is most probable.

Width of rain belt ahead of warm front is generally between 100 and 200 miles.

Fig. 1b.



Vertical section of the depression along the line XY.

[*See over page.*

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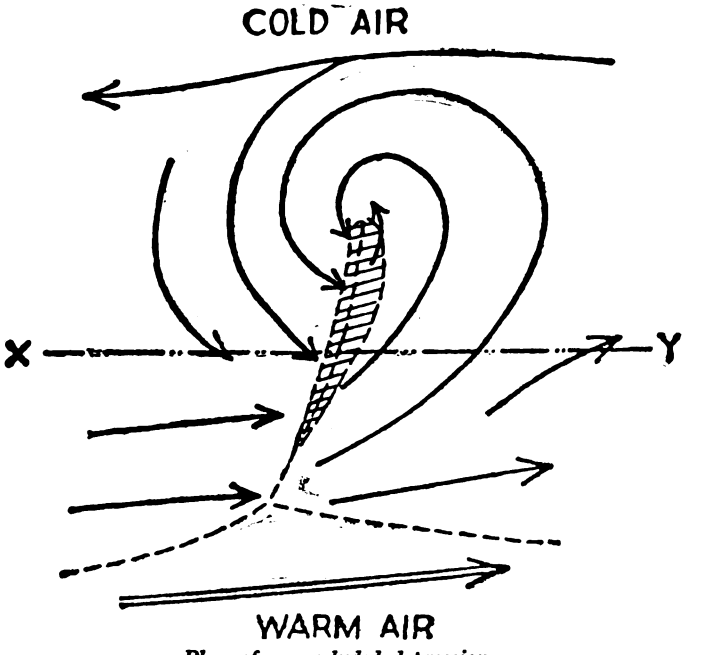
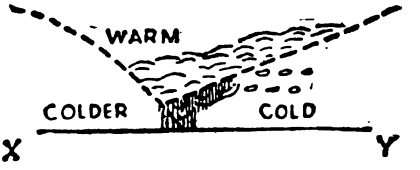
Fig. 2a.



Plan of an occluded depression.

The shading shows the region where rain (or snow) may be expected near the occlusion.

Fig. 2b.



Vertical section of an occlusion of the cold front type.

The air in front of the occlusion is warmer than the air behind it.

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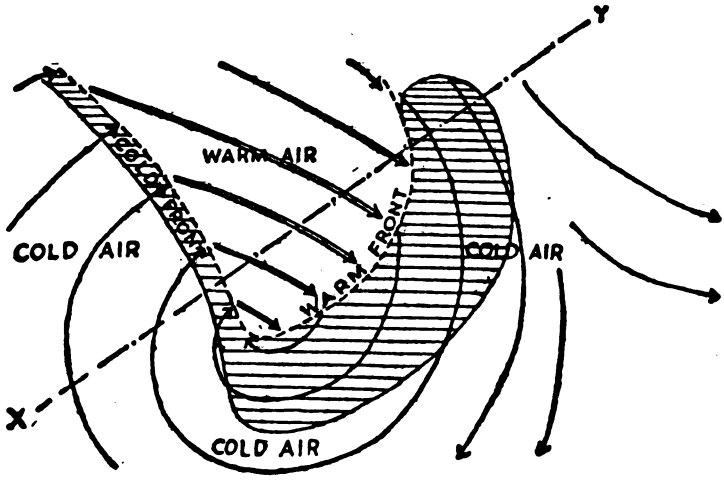
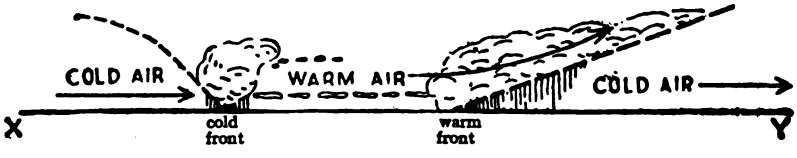
Fig. 1a.



Plan of a developed depression.

The double lines show the flow of the warm air, and the single lines the flow of the cold air.
The shading shows the area where rain (or snow) is most probable.
Width of rain belt ahead of warm front is generally between 100 and 200 miles.

Fig. 1b.



Vertical section of the depression along the line XY.

[*See over page.*

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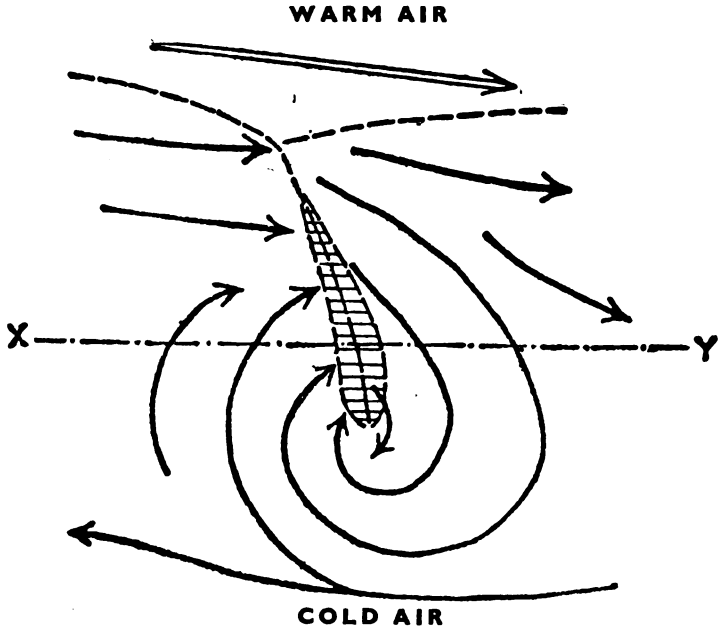
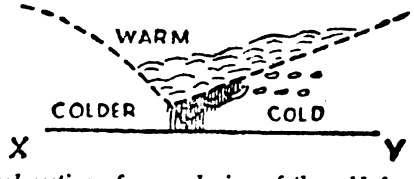
Fig. 2a.



Plan of an occluded depression.

The shading shows where rain (or snow) may be expected near the occlusion.

Fig. 2b.



Vertical section of an occlusion of the cold front type.

The air in front of the occlusion is warmer than the air behind it.

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the season of their occurrence should be constantly on the alert for any sign of their approach, so that steps can be taken to avoid the danger zone while there is still time and sea-room.

Localities, season, and average frequency.—Tropical storms occur for the most part on the western side of the oceans, though they are also experienced in the Bay of Bengal, off the north-west coast of Australia, and off the west coast of Central America. They are unknown in the South Atlantic. They are given various names according to the part of the World in which they occur.

Western North Atlantic	hurricanes
Eastern North Pacific	hurricanes
South Pacific	hurricanes
Western North Pacific	typhoons
Indian Ocean	cyclones
Bay of Bengal	cyclones
Arabian Sea	cyclones
North-west Australia	willy-willies

They are most frequent during the late summer and early autumn of their hemisphere; they are comparatively rare in the southern hemisphere from mid-May to November, and in the northern hemisphere from mid-November to mid-June. In the Arabian Sea, however, storms are most likely to occur at the change of the monsoon, i.e., October–November, and May–June, though they average only one or two a year. Out-of-season storms occur from time to time, particularly in the western North Pacific where no month is entirely safe, and in the Indian Ocean where one is reported south of the Equator perhaps once in two years outside the usual season. The following table shows approximately the average number of severe tropical storms recorded per annum, from statistics taken over several years for the various areas:—

West Indies	5
Western North Pacific	25
,, South Pacific	3
Southern Indian Ocean	6
Bay of Bengal	2
Arabian Sea	1
Eastern North Pacific	3
West Coast of Australia	1

Variations in any one year amounting to 50% above or below the average are not unusual. Some of the figures quoted are probably an underestimate since in the less-frequented parts of the world many storms must escape detection.

Origin, movement and extent.—Tropical storms originate as a general rule in the doldrums, between the parallels of 7° and 15° of latitude; those which affect the western part of the Pacific, South Indian and North Atlantic Oceans are first reported in the western third of those oceans, though there are exceptions such as in the North Atlantic during August and September where an occasional storm is known to begin near the Cape Verde islands. In the northern hemisphere they move off in a direction between 275° and 350°, though most often within 30° of due west. When in a latitude of 25° or so they usually recurve away from the equator and, by the time they have reached the 30th parallel, the track (or path as it is more usually called) is north-easterly. In the southern hemisphere they move off in a WSW.

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to SSW. direction (usually the former), recurve at about 15° to 20° S., and thereafter adopt a south-easterly path. In either hemisphere many storms do not recurve but continue in a west-north-westerly (or west-south-westerly) direction until they reach the mainland where they quickly die.

The speed of advance of these storms is usually about 10 knots in their early stages, increasing a little with latitude; it seldom exceeds 15 knots before recurving, but after recurving 20 to 25 knots is usual though speeds of 40 knots or even more have been known.

Occasionally storms move erratically, the path turning towards the equator, or adopting an easterly component in a low latitude, or even making a complete loop, but on these occasions their speed of advance is low, usually less than 10 knots, while the unusual path is being followed.

The extent of the storm area varies considerably with individual storms but, generally speaking, winds of force 7 or more are improbable at more than 200 miles (especially on the equatorial side of the storm area) and force 8 is unlikely to be exceeded at more than 100 miles, from the storm centre, if in a latitude of less than 20°. Thereafter the radius increases with latitude so that these distances are nearly doubled on reaching the 35th parallel, but the intensity diminishes near the centre. Hurricane force winds are likely within 75 miles of the storm centre in the tropics, and gusts exceeding 150 knots have been reported in a few instances within 50 miles or so (except in the eye of the storm). The aim of the mariner should therefore be to remain as far as possible from the centre of the storm system.

Warning of existence or approach.—In most instances, warning of the position, intensity and probable movement of a storm is given by radio at frequent intervals by meteorological authorities ashore. (*See* Admiralty List of Radio Signals, Volume III.) Sometimes, however, there is insufficient evidence available for an accurate warning or even a general warning to be given and ships must then be guided by their own observations. Of the following indications of the proximity of a tropical storm, the first is by far the most reliable within 20° or so of the equator; it should be borne in mind, however, that very little warning may be expected of the approach of an intense storm of unusually small diameter.

(*a*) If the corrected barometer reading is 3 mb. or more below the mean for the time of year, as shown in a climatic atlas or on the appropriate chartlets in the meteorological text of this Pilot, suspicion should be aroused and action taken to meet any development, such as raising steam in any available additional boilers, &c. It should be noted, however, that the barometer reading must be corrected not only for height, latitude, temperature and index error (if mercurial), or for height and index error if aneroid, but also for diurnal variation, the amount of which is given for each hour of the day in the Air Ministry climatic atlases and in the meteorological text of this Pilot. If the reading thus corrected is 5 mb. or more below normal, it is time to take avoiding action for there can be little doubt that a tropical storm is in the vicinity. According to an analysis of observations in the Western Pacific the centre of the storm is then probably not more than 200 miles away. At this distance, at any rate in the China Sea vicinity, the wind has usually increased to about force 6.

When proceeding through an area liable to be visited by these storms it is desirable to take hourly readings of the barometer.

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(*b*) An appreciable change in the direction and/or strength of the wind.

(*c*) A swell is sometimes evident, proceeding from a direction that approximates to the bearing of the centre. If ahead of the storm this indication may be apparent before the barometer begins to fall.

(*d*) Extensive cirrus cloud followed, as the storm becomes closer, by much alto-stratus cloud and subsequently fracto-cumulus or "scud."

(*e*) In addition there is the warning that can be given by Radar. The existence of moderate or heavy rain can usually, under favourable meteorological conditions, be detected at the extreme range of centrimetric radar, such as is normally used for navigational purposes afloat, depending on the vertical extent of the rainfall. Subrefraction might decrease and superrefraction increase this range as with any other target. Although moderate or heavy rain does not fall symmetrically all round a storm, it is continuous for at least 50 miles in a broad sector extending from the "eye" of the storm where there is a circular area of relatively light winds and clear or partially clear sky. By the time radar evidence of the exact position of the storm is available, the ship will probably be already in fairly high seas and experiencing winds of force 9 or 10. There should still be time, however, for her to avoid the centre of the storm.

Note.—In accordance with Article 35 of the International Convention for Safety of Life at sea it is the duty of every ship who suspects the presence or formation of a tropical revolving storm immediately to inform other vessels and shore authorities with all the means at her disposal. Weather reports should be made by radio at frequent intervals giving as much information as possible, especially corrected (*not* for diurnal variation as in (*a*) above) barometer readings. If barometer readings are uncorrected this fact should be stated in the signal.

Information required by the seaman before deciding upon action to be taken.—To decide on the best course of action if a storm is suspected to be in the vicinity, the mariner requires to know:—

(*a*) the bearing of the centre of the storm;

(*b*) the semicircle in which the ship is situated;

(*c*) the path of the storm.

If an observer faces the wind, the centre of the storm will be from 9 to 11 points on his right-hand side in the northern hemisphere when the storm is about 200 miles away, i.e., when the barometer has fallen about 5 millibars and the wind has increased to force 6 or thereabouts; as a rule the nearer one is to the centre the more nearly does the angular displacement of the wind approach 8 points. A further check on the bearing of the centre may often be obtained by noting the direction from which the swell is coming. The swell travels approximately directly outward from the storm centre.

The semicircle in which the ship is situated can be determined by taking two such bearings with an interval of from two to three hours between observations, provided that allowance is made for the ship's movement. It can be assumed that the storm is not travelling towards the equator; and, if in a lower latitude than 20°, its path is most unlikely to have an easterly component; and, on the rare occasions when neither of these statements applies, the storm is moving very slowly. (Exceptions to this are most likely in the South Pacific, where occasional storms often move off on a course almost due south developing an easterly component at a latitude of about 15°, and in the western

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North Pacific where some of the out-of-season storms may recurve at an early stage.)

In a moving ship associated with a storm progressing at an unknown rate, it is very difficult to estimate from an apparent shift of wind the direction and speed of the storm's motion relative to the ship. The surest method of ascertaining the true shift of wind and thereby finding out in which semicircle the vessel is situated, *is to stop the ship during the period between the two bearings*. If in either hemisphere, these observations show that the wind is veering, the ship is in the right-hand semicircle; if the wind is backing she is in the left-hand semicircle; and if the wind remains steady in direction then the vessel is in the direct path of the storm, which is the most dangerous place of all.

The diagram headed "Typical Paths of Tropical Storms" (at the end of this article) illustrates the terms "dangerous semicircle" and "navigable semicircle." The former lies on the side of the path towards the usual direction of recurvature, i.e., the right-hand semicircle in the northern and the left-hand semicircle in the southern hemisphere. It is so called because a sailing or low-powered vessel caught in it may be blown towards the path along which the storm will pass, or the storm may recurve and the centre pass over her. The navigable semicircle is that which lies on the other side of the path. A ship situated within this semicircle will tend to be blown away from the storm centre, and the recurvature of the storm will increase her distance from the centre.

Practical rules for avoiding tropical storms.—In whatever situation a ship may find herself, the matter of vital importance is to avoid passing within 50 miles or so of the centre of the storm; it is preferable to keep outside a radius of 200 miles or more, because at this distance the wind does not often exceed force 7 (and is generally not more than force 6), and freedom of manœuvre is maintained. If a ship has at least 20 knots at her disposal, and shapes a course that will take her most rapidly away from the storm before the wind has increased above the point at which her movement becomes restricted, it is seldom that she will come to any harm.

Sometimes a tropical storm moves so slowly that a vessel, if ahead of it, can easily outpace it or, if astern of it, can overtake it. Since, however, she is unlikely to feel seriously the effects of a storm so long as the barometer does not fall more than 5 mb. (corrected for diurnal variation) below the normal, it is recommended that frequent readings should be made if the presence of a storm in the vicinity is suspected or known, and that the vessel should continue on her course until the barometer has fallen 5 mb., or the wind has increased to force 6 when the barometer has fallen at least 3 mb. If and when either of these events occurs, she should act as recommended in the following paragraphs, until the barometer has risen above the limit just given, and the wind has decreased below force 6. Should it be certain, however, that the vessel is behind the storm, or in the navigable semicircle, it will evidently be sufficient to alter course away from the centre.

In the northern hemisphere.—(*a*) If the wind is veering, the ship must be in the dangerous semicircle. A steam or other power-driven vessel should proceed with all available speed with the wind 1 to 4 points (depending upon her speed) on the starboard bow, and should subsequently haul round to starboard as the wind veers, thereby tracing a course relative to the storm as shown by the peoked line in the diagram. If a steamer has insufficient room to make much headway when in the dangerous semicircle she should heave to in the

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most comfortable position relative to the wind, preferably with the wind on her starboard bow so that she is heading away from the centre of the storm.

(*b*) If the wind remains steady in direction, or if it backs, so that the ship seems to be nearly in the path (it is sometimes difficult to determine satisfactorily if indeed the ship is nearly in the path, particularly if in the dangerous semicircle, because the wind does not always behave according to rule) or in the navigable semicircle respectively, a steam vessel should bring the wind well on the starboard quarter and proceed with all available speed, subsequently altering course to port as the wind backs, thus tracing a course relative to the storm as shown by the pecked line in the diagram.

In the southern hemisphere.—(*a*) If the wind is backing, the ship must be in the dangerous semicircle. A steam or other power-driven vessel should proceed with all available speed with the wind 1 to 4 points (depending upon her speed) on the port bow, and should subsequently haul round to port as the wind backs, thereby tracing a course relative to the storm, as shown by the pecked line in the diagram. If a steamer has insufficient room to make such headway she should heave-to in the most comfortable position relative to the wind, preferably with the wind on her port bow so that she is heading away from the centre of the storm.

(*b*) If the wind remains steady in direction, or if it veers, so that the ship seems to be nearly in the path (it is sometimes difficult to determine satisfactorily if indeed the ship is nearly in the path, particularly if in the dangerous semicircle, because the wind does not always behave according to rule) or in the navigable semicircle respectively, a steam vessel should bring the wind well on the port quarter and proceed with all available speed, subsequently altering course to starboard as the wind veers, thus tracing a course relative to the storm as shown by the pecked line in the diagram.

If there is insufficient room to run when in the navigable semicircle, and it is not practicable to seek a safe and effective shelter before the storm begins to be felt, a vessel should heave-to in the most comfortable position relative to the wind and sea, bearing in mind the proximity of land.

If a ship finds that she is in the direct path of the storm and has no room to run into the navigable semicircle as directed above, it should be considered, bearing in mind possible recurvature, whether she should endeavour to make her way into the " dangerous " semicircle (where she may at least be better off than remaining in the direct path of the storm) and continue to steam to windward as fast as she can so as to get as far as possible from the centre.

If in harbour, or at anchor, a seaman should be just as careful as at sea in watching the shifting of the wind and estimating the movement of the storm relative to himself, so that he may consider shifting his berth with advantage or otherwise act according to circumstances. It is usually preferable, however, to put to sea if this can be done in sufficient time to avoid the worst of the storm. Riding out a tropical storm, the centre of which passes within 50 miles or so, in a harbour or anchorage, even if some shelter is offered, is an extremely unpleasant and hazardous experience, especially if there are other ships in company. Even if berthed alongside, or with special moorings and long bridles in use, a ship cannot feel entirely secure.

Discretion must, of course, be used. In the case of a low-powered or small vessel with, for example, insufficient warning to enable her to

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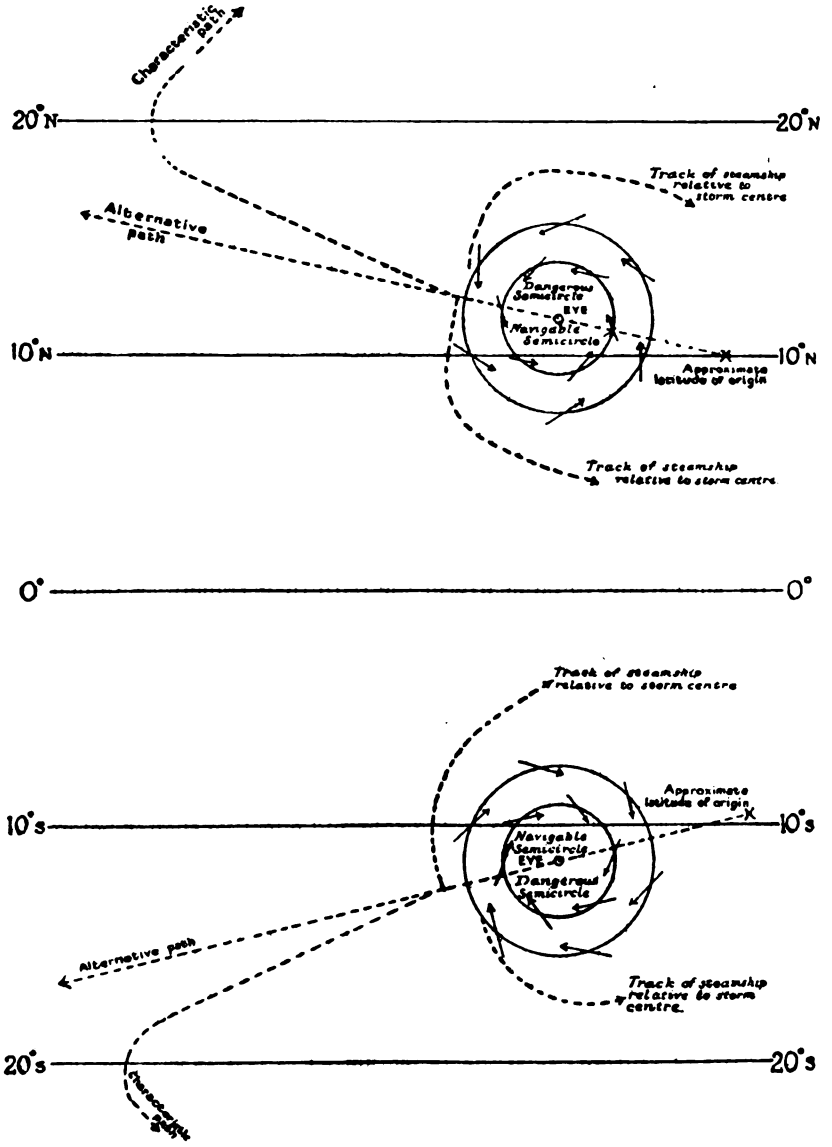
TYPICAL PATHS OF TROPICAL STORMS



Note.—In this diagram the isobars are shown as concentric circles about the eye; in practice this is usually the case within 150 miles or so of the centre. Outside this distance the isobaric form often loses its symmetry and strong winds often extend farther on the polar side than on the equatorial.

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gain sufficient distance from the storm by putting out to sea, it will be preferable to remain in a reasonably sheltered harbour. If at sea and warning of an approaching storm is given and there is considered to be insufficient time or sea room to avoid the dangerous part of the storm area, it may be advisable for vessels of this type to seek shelter. In the China Sea, for example, there are so-called typhoon harbours which are listed in the Admiralty Pilot. In all cases, however, the mariner must use seamanship and initiative.

(3) **Local modification of the weather near the coast.** The information given in Chapter I on climate and weather in the area covered by the Pilot refers necessarily to the coastal and sea regions generally but cannot attempt to deal with the local effects on the wind and weather of each separate headland, bay, or creek. The following notes, however, should prove helpful in showing how the weather in the general vicinity is likely to be modified by the topography or shape of the land close to the actual place in which the mariner is concerned.

(i) If the coastline is steep-to, onshore winds that approach it at an angle are usually deflected nearly along the shore and increased somewhat in speed. And when the wind approaches a strait whose direction is somewhat similar to that of the wind, the wind tends to blow along the strait and increases in speed as the strait narrows.

When a strong wind blows directly towards a very steep coast, there is usually a narrow belt of contrary gusty winds close to the coast.

(ii) Similarly when the wind blows onshore towards the entrance to a wide estuary, especially one with hills on both sides, it generally tends to blow up the estuary. This effect is most marked in the afternoon but there is often no such tendency during the night and early morning.

(iii) An offshore wind is often squally on the lee side of hilly coasts, especially when the air is much colder than the sea, as for example when it blows off snow-covered land and when the wind over the open sea is force 5 or more.

(iv) Near headlands or islands with steep cliffs there may be large changes in direction (up to about 90°) and speed of the wind in addition to those mentioned above.

(v) During quiet and warm weather with clear or fairly clear skies, a sea breeze is of common occurrence during the warmer part of the day; it is especially frequent in the tropics and subtropics. It blows onshore from, on the average, 4 to 8 hours after sunrise until shortly before sunset, reaching its maximum development during the afternoon (1300 to 1600); if there is an appreciable regional or general wind, then this will be modified by the onshore sea breeze. Under particularly favourable circumstances such as high dry temperatures, relatively cool sea, and hilly background to coast, the sea breeze may blow as much as force 4 (occasionally 5) and extend 20 miles or more to seaward from the shore. At night under similar circumstances a lighter breeze blows from the land to the sea; it seldom extends more than 5 miles from the shore nor does it become appreciable much before 2200 local time; under favourable conditions, as in the tropics, it usually lasts until an hour or so after sunrise.

(vi) When sea fog that is caused by the passage of warm air over a

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colder sea surface is general over the open sea, visibility is better close to leeward of a hilly island or promontory than to windward. This effect is most marked in late spring and summer, during the early afternoon when the land is at its warmest, and then applies to low-lying land as well.

(vii) Radiation fog which forms over land on quiet nights with clear skies, mainly in autumn and winter, and sometimes spreads a few miles out to sea, is least thick during the afternoon and is often worst during the first hour or two after sunrise.

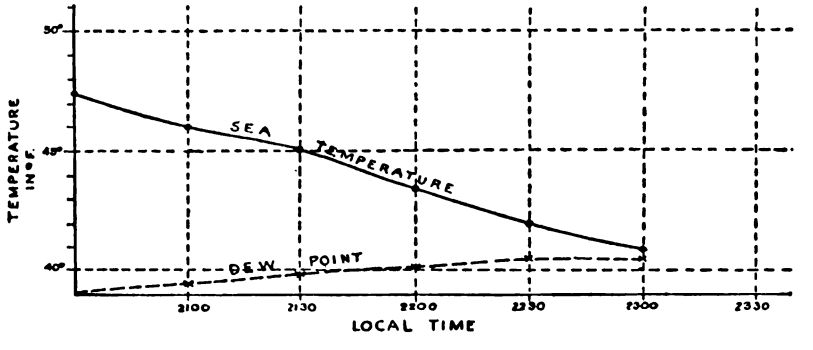
(4) **Forecasting sea fog.**—The most frequent type of fog in the open sea is that caused by relatively warm air flowing over a colder sea. Warning of this type of fog may be obtained by frequent observations of air and sea surface temperatures; if the sea temperature falls below the dewpoint of the air, fog is almost a certainty. The following procedure is recommended whenever the temperature of the air is higher than, or about equal to, that of the sea, especially at night when approaching fog cannot be seen until shortly before entering it.

Sea and air (both dry and wet bulb) temperatures should be observed at intervals of about 5 miles and the sea temperature plotted against dewpoint. The dewpoint is obtainable from tables published in various text-books, but at temperatures up to about 60° F. a close enough approximation may be obtained by assuming it to be the same amount below the wet-bulb temperature as the latter is below the dry-bulb temperature; for example, if the dry bulb reads 50° F. and the wet bulb 48°, the dewpoint is about 46°. If the curves of sea temperature and dewpoint converge, fog may be expected by the time at which they coincide.

The figure below represents conditions that might be found by a low-powered ship in about long. 40° W. proceeding westward on the appropriate lane route for Halifax, Nova Scotia. At 2200 it would become evident that there is a probability of running into fog in about an hour's time, assuming that the sea temperature continues to fall at about the same rate that it has done during the last 1½ hours.

From the appropriate chart of average sea surface temperatures it can be seen where a rapid fall of temperature may be expected, so that if the dewpoint is within 5° or so of the sea temperature when approaching the colder water zone, this will also give a fairly reliable warning of fog.

If it is desirable and practicable to escape from fog, a ship should steer for warmer water which will again be evident from the charted isotherms.



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Fog, or very poor visibility, at sea may also occur in snow or heavy rain, or in association with the passage of a warm front or occlusion, or, when within 20 miles or so of land, it may occur as a result of radiation fog extending from the land; in high latitudes in winter, sea smoke may be met near land, when very cold offshore winds are blowing, or near extensive ice. The method described above will not give warning of these fogs, of which frontal fogs, though common in middle latitudes, are neither so extensive nor so persistent in any one locality, and the other fogs mentioned are rarely encountered far from land (or extensive ice).

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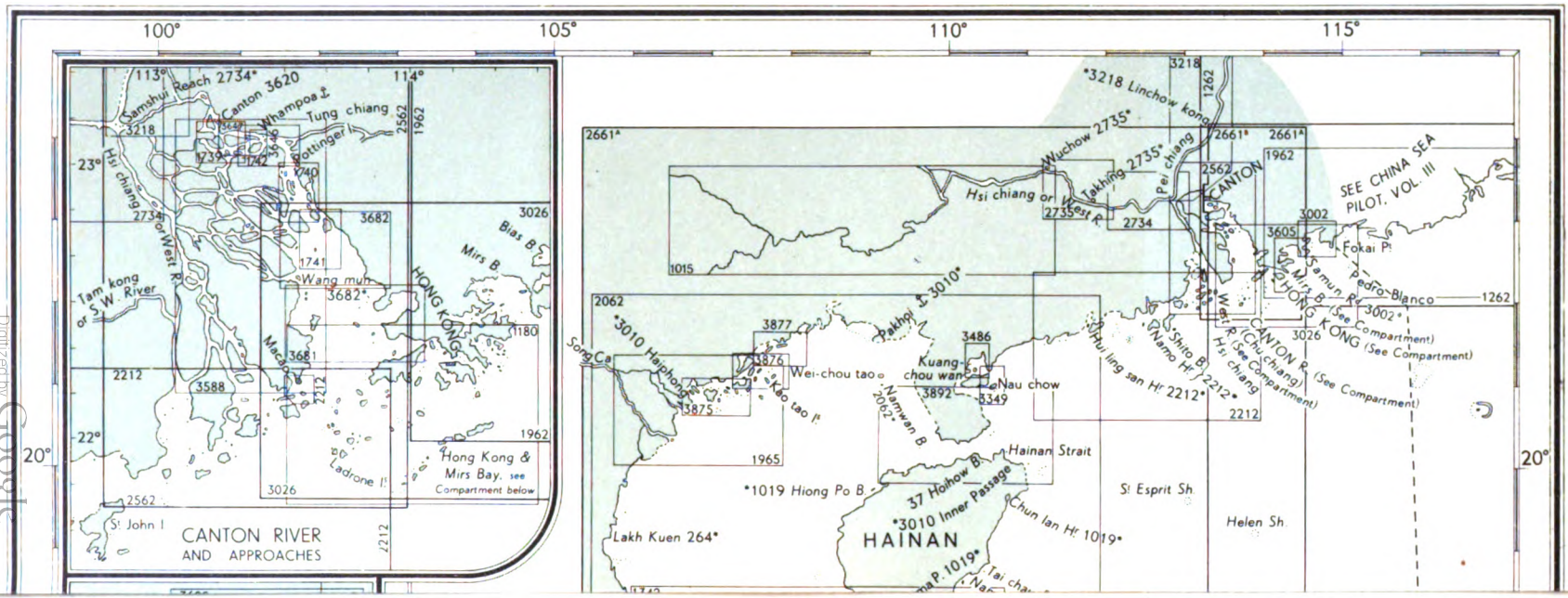

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IMPORTANT.

Details of Lights, Fog Signals, and Time Signals (visual) are not included in this volume; for this information the Admiralty List of Lights, Vol. 6, should be consulted.

Information regarding Vertical Movement of the Water is not included; for this the Admiralty Tide Tables should be consulted.

Details of Radio information (weather bulletins, storm and navigational warnings, time signals, fog signals, and D.F. stations) are not included; for this information the Admiralty List of Radio Signals should be consulted.

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CHINA SEA PILOT

VOL. I

CHAPTER I

GENERAL REMARKS — MALAY PENINSULA — MALAY STATES — THAILAND — FRENCH INDO-CHINA — CHINA — HONG KONG — CURRENTS — TIDES — SIGNALS — CAUTIONS — PILOTS — BUOYAGE — FUEL — REPAIRS — RADIO STATIONS — STANDARD TIME — CONSULS — REGULATIONS — QUARANTINE — PASSAGES — CLIMATE AND WEATHER

Charts 1263, 748b.

GENERAL REMARKS.—The China sea is bounded on its western side by the Malay peninsula, the coasts of Thailand, French Indo-China (consisting of Cambodia and Viet-Nam), and Kwangtung, the south-western province of China. The description of these coasts, from Tanjong Penawar (*Lat. 1° 31′ N., Long. 104° 17′ E.*) to Hong Kong, about 1,400 miles north-eastward, with certain outlying dangers bordering on the main route between them, forms the subject of this volume.

On its eastern side, the China sea is bounded by the western coasts of Borneo, Palawan, and the Philippine islands, which, with certain outlying dangers, are described in China Sea Pilot, Volume II. The pecked line on the index chart, facing page 1, indicates the dividing line between the two volumes.

Chart 1263.

Towards the centre of the eastern part of the China sea there is a considerable area known as " Dangerous Ground." This area, occupied by coral banks and reefs, is only partially surveyed, and should be avoided by all vessels ; it is described in China Sea Pilot, Volume II.

Mariners are advised to follow the tracks recommended, which are shown on the charts.

Chart 748b.

MALAY PENINSULA.—The Malay peninsula lies between Malacca strait on its western side and the China sea on its eastern side, the Malay States being situated in the central and broadest part of the peninsula. The Federation of Malaya came into force on 1st February, 1948. It consists of nine states of the Malay peninsula and the two

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Chart 748b.

British settlements of Penang and Malacca. The States included in this volume are Johore (East coast), Pahang, Trengganu and Kelantan.

The total area of the Federation is about 50,650 square miles, and the population at the census, in 1947, was 4,908,086.

At the southern end of the Malay peninsula is Singapore island, which with its approaches are described in the Malacca Strait Pilot.

A general description of the physical features, minerals, flora and fauna of the Malay peninsula will be found in Chapter I of the Malacca Strait Pilot.

MALAY STATES.—Government.—The central government consists of a federal executive council and federal legislative council under the High Commissioner. Each state is governed by its ruler. The King, through the High Commissioner, exercises control over questions of defence and external relations.

Industry.—The principal industries are padi, rubber, mining, coconuts, oil palms, pineapples and fishing.

Currency.—Weights and measures.—The standard currency of the Federation is the Malayan dollar divided into 100 cents, and equalling 2*s.* 4*d.* sterling. The standard measures are the imperial yard, pound and gallon.

Subsidiary silver coins are 20, 10 and 5 cent pieces; nickel 5-cent pieces; copper one-cent pieces. Currency notes are also in circulation.

The commercial weights and measures are :—

1 Kati	=	16 Tahil	= 1⅓ lb. avoirdupois
1 Picul	=	100 Kati	= 133⅓ lb. avoirdupois
1 Koyan	=	40 Picul	= 5333⅓ lb. avoirdupois
1 Chupak	=	1 quart	
1 Gantang	=	1 gallon	
1 Kaki	=	1 foot	
2 Hastas	=	1 yard	
2 Elas	=	1 depa	= 1 fathom

Chart 3543.

Johore.—The state of Johore lies at the southern end of the Malay peninsula, its eastern coast, with its off-lying islands, extending northward to Kuala Endau (*Lat. 2° 40′ N., Long. 103° 38′ E.*). The country is less mountainous than other parts of the Malay peninsula.

The population, in 1947, was 738,251.

Johore Bahru, on the northern shore of Johore strait, is the capital.

The most important rivers on the eastern side of Johore are Sungei Sedili Besar and Sungei Endau; the latter flows from the foot hills of Gunong Besar, about 30 miles west-south-westward of Kuala Endau and, towards the end of its course, separates Johore from Pahang. Sungei Sembrong and its tributaries, rising in a range of mountains which culminates in Gunong Blumut, 3,308 feet (1,008m2) high, about 38 miles southward of Kuala Endau, join Sungei Endau about 12 miles southward of its mouth.

Communication.—The railway which connects Singapore with Bangkok passes through Johore from Johore Bahru to Gemas, about 97 miles north-westward; other internal communication is maintained by rivers and roads.

Small steamers occasionally call at Mersing (*Lat. 2° 26′ N., Long. 103° 51′ E.*) on the eastern side of Johore.

The more important places in Johore are connected to the general telegraph and telephone systems.

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Chart 3543.

Pahang.—The coast line of the state of Pahang extends from Kuala Endau to Tanjong Geliga Besar (*Lat. 4° 10′ N., Long. 103° 27′ E.*), about 95 miles northward.

Endau, Anak Endau, Pontian, Rompin, Pahang, and Kuantan rivers discharge into the China sea. These rivers are available for small craft during the South-west monsoon, but, with the exception of the Sungei Kuantan, are often inaccessible during the North-east monsoon. Sungei Pahang is the largest and is fairly wide for about 70 miles. It is joined by several tributaries, some of which take their rise in the mountains of Selangor and Negri Sembilan.

Communication.—The railway which connects Singapore with Kelantan passes through the western part of Pahang.

The principal towns are connected to the general telegraph and telephone systems.

The population, in 1947, was 250,178.

Chart 2414.

Trengganu.—The coast line of the state of Trengganu extends from Tanjong Geliga Besar to a point about 3 miles north-westward of the mouth of Sungei Besut, which is situated about 113 miles north-westward of Tanjong Geliga Besar; its inland boundaries follow the watersheds of its biggest rivers, namely, the Kemaman, Dungun, Trengganu, and Besut.

The western and inland half of Trengganu is almost uninhabited, the population being concentrated on the rivers and along the coast line.

The country is divided into sixteen river basins. All the rivers discharge into the China sea. Sungei Kemaman and Sungei Trengganu can be entered by coasting steamers all the year round, but the other rivers can be entered only by small craft, and during the North-east monsoon the landing and loading of cargo by lighters is frequently impracticable.

Sungei Kemaman, which traverses the southern portion of the state, is navigable by large river boats for a distance of from 30 to 40 miles. Sungei Trengganu, above the Kelemang falls, is mainly formed by the confluence of Sungei Kerbat and the Sungei Trengganu Ulu. The Kelemang falls constitute a formidable barrier to all river traffic, consisting of a flight of eight rapids or cataracts, extending over a distance of 3 miles; the rocky nature of the bottom of the river continues for another 3 miles, and in the whole 6 miles the drop is from 80 to 100 feet (24^{m}4 to 30^{m}5). In both the rivers described above there are depths of as much as 10 fathoms (18^{m}3) in places, but for the most part they are shallow and rapid.

The Tenggol, Kapas, Redang, and Perhentian islands, which all lie less than 20 miles offshore, belong to Trengganu.

The population of the state at the census in 1947 was 225,996.

Communication.—There is telegraphic communication from Kuala Trengganu along the coast to Kemaman and thence southward via Kuantan to Singapore, and also northward from Kuala Trengganu to Kota Bharu.

Kelantan.—The state of Kelantan lies between Trengganu on its eastern side, Pahang on its southern side, Perak on its western side, the Kingdom of Thailand on its north-western side, and the China sea on its north-eastern side. The coast, about 40 miles long, is low and sandy, backed by a fertile plain densely populated and closely cultivated. Southward of the plain the country is hilly, the highest

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Chart 2414.

hills being those of the main range of the Malay peninsula; this part of the state is thinly populated.

Kota Bharu (*Lat. 6° 09′ N., Long. 102° 14′ E.*), situated near the mouth of the Kelantan river, is the capital.

Sungei Kelantan, the basin of which comprises nearly the whole of the state, is the most important river. It has a length of about 120 miles and is navigable by shallow-draught launches for about 80 miles, but ocean-going vessels cannot cross the bar at the mouth. Other rivers are Sungei Semerak, which discharges into the China sea close north-westward of the boundary of the state of Trengganu, and Sungei Golok, which discharges into the China sea about 8 miles west-north-westward of the mouth of Sungei Kelantan.

Communication.—The coasting steamers, which ply between Singapore and Bangkok, call regularly at Semerak, Bachok, about 13 miles north-westward, and at Tumpat, on the western side of the delta of Sungei Kelantan.

Kelantan is connected by rail with Bangkok, and with Penang on the south-western side of the Malay peninsula, through lower Thailand and Kedah. There is also direct railway communication with Singapore through Pahang. Other internal communication is by means of rivers and roads.

The principal towns are connected to the telegraph and telephone systems.

The population at the census in 1947 was 448,572.

THAILAND.—The limits of the kingdom of Thailand have varied much at different periods of its history. In this volume the coast, bordering the China sea, is considered to extend from the northern border of the state of Kelantan to Cambodia.

The most important district is the wide valley of the Maenam Chao Phraya, or Bangkok river, which overflows its banks from June to November; the success of the rice crop depends on the regularity and amount of this inundation. The Maenam Chao Phraya is the great highway of the country, and around it are the most settled and advanced districts of Thailand.

Chart 748b.

Chieng Mai (*Lat. 18° 50′ N., Long. 98° 53′ E.*), one of the most important trading centres, is situated inland on the Me Ping branch of the Maenam Chao Phraya, about 300 miles northward of Bangkok, and is the terminus of the railway from that city. It does a considerable trade with Moulmein, as well as with Bangkok.

Chart 2414.

The two provinces of Patani and Nagorn Sridharmraj are situated in the Malay peninsula at the southern end of Thailand. They possess a fertile soil and great wealth of minerals, are prosperous and thickly populated. A shallow inland sea is entered at Singora (Songkhla), the capital of Nagorn Sridharmraj.

The chief so-called ports of these provinces, mostly open anchorages, are Saiburi, Patani and Singora. The bar of the Patani river prevents any but boats entering; steamers have to lie a long way off and the bar is constantly extending seaward. Singora bar, under very favourable circumstances, admits vessels drawing about 12 feet (3^{m}7) at the highest tides, but none of the regular steamers enter, as the tides are rarely convenient. *See* also on page 141.

Northward of Nagorn Sridharmraj is the province of Chumporn,

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Chart 2414.

divided into three parts, namely, Langsuan, Chiya, and Chumporn; the town of Bandaun (Suratthani) (*Lat. 9° 11′ N., Long. 99° 20′ E.*) is the capital. The chief ports of this province are Ko Samui, Bandaun, Langsuan, and Chumporn, but they are generally closed during the North-east monsoon.

Pearl fisheries exist off the coast of this province, more particularly near the town of Chumporn and off Ko Samui.

Government.—Under the constitution of 23rd March, 1949, the supreme power belongs to the nation, and the King, who is the head of the nation, exercises the legislative power by and with the advice and consent of Parliament. Parliament consists of a Senate and a House of Representatives. The executive power is exercised by the state council, which is appointed by the King.

The kingdom is divided into 71 provinces, each governed by a commissioner who is directly responsible to the Minister of the Interior. The prevailing religion is Buddhism.

Production.—Trade.—The chief product of Thailand is rice, which forms the principal national food, and, with rubber and teak, is the staple article of export. Other products are sugar, coconuts, tobacco, pepper and cotton. The mineral resources are tin ore, wolfram, antimony, coal, copper, gold, iron, lead, manganese, rubies, sapphires and zinc.

Nearly all the trade is in hands of foreigners, and many Chinese have settled in the country.

The principal imports are cotton goods, foodstuffs, machinery, vehicles, paper, electrical apparatus, &c.

Currency.—Weights and measures.—The unit of currency is the baht, a silver coin, divided into one hundred satang. The circulation medium is almost entirely paper, consisting of 5, 10, 20, 100 and 1,000 baht notes.

Other silver coins are 50 satang and 25 satang pieces; the 10 and 5 satang pieces are nickel, and the one satang piece, bronze.

Notes and baht coins are legal tender without limit as to amount; 5 and 25 satang pieces legal tender up to 5 baht, and nickel and bronze coins legal tender up to one baht.

The units of weight are:—1 Standard Picul = 60 kilograms, or about 132 lbs.; 1 Standard Catty ($\frac{1}{100}$ Picul) = 600 grammes, or about 1⅓ lbs.; 1 Standard Carat = 20 centigrammes, or about 3 grains.

The units of length are:—1 Sen = 40 metres, or about 131 feet; 1 Wah ($\frac{1}{20}$ Sen) = 2 metres, or about 6½ feet; 1 Sawk (¼ Wah) = 0·50 metre, or about 1½ feet; 1 Keup (½ Sawk) = 0·25 metre, or about 10 inches.

The units of square measure are:—1 Rai (1 Square Sen) = 1,600 square metres, or about 0·4 acre; 1 Ngan (¼ Rai) = 400 square metres, or about 15·8 rods; 1 Square Wah ($\frac{1}{100}$ Ngan) = 4 square metres, or about 4·8 square yards.

The units of capacity are:—1 Standard Kwien = 2,000 litres, or about 440 gallons; 1 Standard Ban (½ Kwien) = 1,000 litres, or about 220 gallons; 1 Standard Sat ($\frac{1}{50}$ Ban) = 20 litres, or about 4·4 gallons; 1 Standard Tanan ($\frac{1}{20}$ Sat) = 1 litre, or about 1·8 pints.

Chart 748b.

Communication.—There were, in 1946, 2,032 miles of railway open to traffic in Thailand, and 135 miles under construction. The Northern line connects Bangkok with Chieng Mai, near the northern border. The North-eastern line connects Bangkok with Ubon, near

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Chart 748b.

the borders of Indo-China, through Korat (Khorat), where there is a branch line running northward to Kawn (Khorn) Ken ; it is proposed to extend the latter line to Nawng Kai (Nong Khai) on the Indo-Chinese border. The Eastern line connects Bangkok with Aranya Pradesa on the border of Cambodia.

The Southern line runs from Bangkok to the frontier station of Padang Besar, where it connects with the Federated Malay States railways. Another line, branching off from Haad Yai (*Lat. 6° 58′ N., Long. 100° 24′ E.*) connects that place with Sungei Golok and thus again with the Federated Malay States railways. There are also branches to Kantang, on the western coast of Lower Thailand, to Nagorn Sridharmraj and to Singora.

There is regular steamer communication between Bangkok and Singapore, via the ports on the shores of the Gulf of Thailand ; also with Hong Kong.

There is occasional communication by air between Bangkok and Europe.

All the principal towns in the kingdom are connected to the general telegraph and telephone systems.

For radio stations, *see* page 28.

Population.—The estimated population of Thailand, in 1947, was 17,317,764.

Chart 1263.

FRENCH INDO-CHINA.—French Indo-China, with an area of about 286,000 square miles, consists of the three Associated States of Cambodia, Laos and Viet-Nam.

Ports.—The principal ports are Saïgon in South Viet-Nam, Cam Ranh, Nhatrang, Qui Nhon, and Tourane in Central Viet-Nam, and Haïphong in North Viet-Nam.

Currency.—The monetary unit is the piastre of 100 cents, and, in 1949, its rate was fixed at 20·58 piastres to the United States dollar.

Communication.—Saïgon is connected by railway with Hanoï, via Nhatrang, Tourane and Vinh, with branch lines from Kongfa to Dalat, from Thanap to Xomkuk, and from Hanoï to Haïphong.

Hanoï is connected by railway to Nasham, on the Chinese border, and to Yunnanfu in China, via Lao-Kai.

Pnom Penh is connected by railway to Battambang and Mongkol-borey on the Thai border.

There is regular steamer communication between Saïgon, Haïphong and Europe, also with Hong Kong and Manila.

A regular service by boat is maintained on the rivers and waterways.

There is communication by air between Saïgon and Europe.

The principal towns are connected to the general telegraph and telephone systems.

Cambodia.—Cambodia lies south-eastward of Thailand. All the eastern portion of Cambodia is an alluvial plain through which Le Mékong runs, overflowing its banks during the rainy months of the year ; westward, the country rises somewhat and is covered with dense forests. The chief towns are Pnom Penh, the capital, with a population of about 260,000 in 1949, situated about 195 miles from the sea, Battambang, 180 miles farther north-eastward, and Kampot, situated on the shores of the Gulf of Thailand, near the boundary between Cambodia and South Viet-Nam.

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Chart 1263.

Products.—Trade.—The chief product is rice; amongst others are tobacco, kapok, cotton, pepper, maize, palm sugar, rubber and silk.

The exports comprise rice, salted fish, pepper, maize, cotton, tobacco, fish oil, palm sugar, kapok, wood, hides and cattle. The chief imports are salt, beverages, textiles, chemicals, cigarettes, iron and opium.

Population.—In 1948, the population of Cambodia was 3,748,328, of whom 4,979 were Europeans.

Laos.—As this state is inaccessible from the sea it will not be described.

Viet-Nam.—The expression Viet-Nam is applied today to the three countries of Cochin-China, Annam and Tonkin.

South Viet-Nam.—South Viet-Nam, formerly Cochin-China, has an area of 26,476 square miles, and lies south-eastward of Cambodia. It is the most important territory in French Indo-China from the point of view of foreign commerce. Saïgon (*Lat. 10° 48′ N., Long. 106° 42′ E.*), the capital, is situated, about 45 miles from the sea, on the Rivière de Saïgon and is connected with the Mékong delta by several navigable streams.

Products.—Trade.—The principal products are haricots, soya, sugar, betel-nuts, copra, rubber, tobacco and ground-nuts.

The chief exports are rice, maize, dried and salted fish, and rubber.

Population.—In 1948, the population of South Viet-Nam was 5,628,472, including 45,440 Europeans.

Central Viet-Nam.—Central Viet-Nam, formerly Annam, is situated northward of South Viet-Nam. Hué, the capital, is situated about 12 miles from the sea.

Products.—Trade.—Rice is the principal product; others are cotton, maize, areca nut, mulberry, cinnamon, tobacco, sugar and betel.

The chief exports are sugar, rice, cotton, cinnamon, tea and paper; the principal imports are cotton yarn, cottons, tea, petroleum and tobacco.

Population.—The population of Central Viet-Nam, in 1943, was 7,183,827, including 9,834 French.

North Viet-Nam.—North Viet-Nam, formerly Tonkin, lies between Central Viet-Nam on the south and the Chinese provinces of Yunnan, Kwangsi and Kwangtung northward and north-eastward. The northern part of North Viet-Nam is mountainous; the Song Ca fertilises a large area of the centre of the country, and the marshy coastland southward of its mouth produces great quantities of rice. The chief town, and capital, is Hanoï, situated about 60 miles north-westward of the mouth of the Song Ca. Haïphong is the principal port.

Products.—Trade.—The chief product is rice; others are maize, arrowroot, sugar cane, coffee, tea and tobacco. A large quantity of raw silk is produced. There are rich limestone quarries, calamine and tin mines, and also hard coal beds.

The chief exports are coal, cement and beans; the principal imports are tools, machinery, yarn, beverages, livestock, potatoes, mineral oils and paper.

Population.—The population of North Viet-Nam, in 1943, was 9,931,193, including 9,615 French.

CHINA.—The only portions of China included in this volume are the province of Kwangsi and part of the province of Kwangtung, which

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Chart 1263.

lie north-eastward of North Viet-Nam, and Hong Kong, which is situated off the coast of the province of Kwangtung. North-eastward of Hong Kong, the coast of China is described in China Sea Pilot, Volume III, where a short history of China will also be found.

The most important feature of the two provinces mentioned above are the rivers which drain them. The rivers have their source, in the province of Yunnan, about 1,200 miles inland and combine to form the Hsi chiang or West river, about 200 miles westward of Macao island, where they flow into the sea.

The province of Kwangsi has no seaboard.

The peninsula of Lui-chow extends about 70 miles from the southern coast of the Kwangtung province, its western side forming the north-eastern shore of the Tongking gulf; on its eastern side is the territory of Kuang chou wan, with the islands of Nau chow and Tan hai in its approach.

Hainan island, which lies southward of the Lui-chow peninsula, and Macao island, in which is the Portuguese settlement of Macao, situated between the mouths of the Hsi chiang and the Chu chiang, are parts of the province of Kwangtung.

Language.—Educated Chinese mostly learn English as their second language and English is the language mainly used for the conduct of China's foreign trade.

Railways.—Kowloon, on the mainland, close northward of Hong Kong, is connected with Canton by railway, and the latter is in railway communication with Peiping, Harbin and Europe.

Canton and San-shui (Samshui) are connected by railway, and the Sunning railway, about 34 miles long, connects Chiang-men (Kongmoon) with the coast northward of Tongkwa.

Weights and measures.—Standards of weights and measures vary all over the country. Two kinds of standards are, however, generally in use, namely the old and the new. The law governing the new standard was promulgated on 6th February, 1929, and was intended to be the legal standard of weights and measures throughout China; this was based on the metric system and was adopted in the Customs service on 1st February, 1934. The old system is, however, still in use and is as follows:—

10 Ch'ien	= 1 Liang (tael)	= 37·301 grammes
16 Liang	= 1 Chin (catty)	= 596·816 grammes
100 Chin	= 1 Tan (picul)	
10 Sheng	= 1 Tou	= 10·354688 litres
10 Tau	= 1 Tan	
10 Fen	= 1 Ts'un (inch)	
10 Ts'un	= 1 Ch'ih (foot)	= 0·32 metre
10 Ch'ih	= 1 Chang	= 3·2 metres
100 Chang	= 1 Li	= 576 metres = $\frac{1}{2}$ mile

The Ch'ih of $14\frac{1}{10}$ English inches has been adopted as the standard; the Tael, Catty and Picul have been fixed at $1\frac{1}{3}$ oz., $1\frac{1}{3}$ lb. and $133\frac{1}{3}$ lb. avoirdupois, respectively. 1 Mow = $\frac{1}{6}$ acre.

Health.—Caution.—Owing to the way the Chinese manure the fields and to the general disregard of sanitary precautions, water becomes polluted, and should never be used for drinking or cooking without being boiled.

Aerated waters sold by the natives, and ice stored by them, must not be used.

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Chart 1263.

Dysentery, cholera, and milder forms of intestinal diseases are common in summer, and occur from drinking impure water, promiscuous use of raw vegetables, or from chills caught when lying on deck at night.

There is a peculiar form of intestinal catarrh, popularly known as sprue, which attacks Europeans predisposed to illness; the mucous membrane is affected, diarrhoea is often profuse, and only fresh milk diet, and often hospital treatment, or removal from the country, can cure the patient.

Chart 1466.

HONG KONG.—The island of Hong Kong is situated on the eastern side of the approach to the estuary of the Chu chiang, about 70 miles south-eastward of the city of Canton. The island is an irregular broken ridge, and has an area of about 32 square miles; it is separated from the mainland by Lei u mun, which is narrow but deep. The city of Victoria extends about 5 miles along the southern shore of the harbour.

Hong Kong is a free port and the main distributing centre for south China and a naval and military station of first-class importance.

The estimated population, in 1949, was about 1,860,000, including about 9,500 British subjects from the United Kingdom and the Dominions.

Government.—The Crown Colony of Hong Kong was ceded by China to Great Britain in January, 1841; the cession was confirmed by the Treaty of Nanking in August, 1842, and the charter bears date 5th April, 1843.

The administration is in the hands of a Governor, aided by an Executive Council, composed of the General Officer commanding the troops, the Colonial Secretary, the Attorney General, the Financial Secretary and the Secretary for Chinese affairs. There is also a Legislative Council presided over by the Governor, composed of 9 official and 8 non-official members. In 1947, the constitution, which was revised, provides for an unofficial majority in the legislative council and for the establishment of a municipal council, consisting of 30 members.

The peninsula of Kowloon, on the mainland northward of the island of Hong Kong, was ceded to Great Britain by Treaty in 1860, and now forms part of the colony.

By a convention signed at Peking on 9th June, 1898, there was leased to Great Britain for 99 years an extensive portion of Chinese territory, mainly agricultural, together with the waters of Mirs bay and Hau hoi wan.

Industry.—The chief industries are ship-building and repairing, rope-making, manufacture of paint, cement, torch batteries, matches and tobacco. Fish is the main primary product.

Shipping.—In 1948, 5,344 ocean-going vessels of 14,708,000 net tons entered and cleared the port.

Currency.—Weights and measures.—The currency consists of notes of the principal banks and subsidiary notes of 10-cent, 5-cent and 1-cent denominations, and 10-cent and 5-cent coins. In 1945 the Colony reverted to its pre-war dollar currency, the dollar being worth 1*s.* 3*d.*

The weights and measures in use consist of the standards in use

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Chart 1466.

in the United Kingdom and of the following Chinese weights and measures:—

Tael (leung)	= $1\frac{1}{3}$ oz. avoirdupois
Picul (taam)	= $133\frac{1}{3}$ lb.
Catty (kan)	= $1\frac{1}{3}$ lb.
Chek (Chinese foot)	= $14\frac{5}{8}$ inches
Tsuen (Chinese inch)	= $\frac{1}{10}$ Chek
Cheung	= 10 chek
Lei (Chinese mile)	= 707 to 744 yards

Communication.—Kowloon is connected with Canton by rail, and thence to the Chinese railway system.

Hong Kong is connected by telegraph and telephone with all parts of the world.

Regular steamship communication is maintained with all parts of the world.

Chart 748b.

CURRENTS.—The surface currents of the China sea flow in accordance with the wind, so that the main currents are those caused by the monsoons and are reversed in direction with the change of monsoon. The south-westerly current of the North-east monsoon is stronger and more constant than the north-easterly current of the South-west monsoon, since the former is the stronger and more constant wind.

The predominant direction of flow during the North-east monsoon period is shown in Figure 1. The current, after setting south-westward through Formosa strait and along the southern coast of China, continues eastward of Hainan and is thence directed towards the coast of Central Viet-Nam (Annam), which it follows closely. In the southern part of the China sea, the direction changes gradually to southward, and subsequently to a little east of south as the current approaches Carimata strait; thence it passes south-eastward into the Java sea.

During the North-east monsoon period, some of the water of the Kuro shio, flowing northward along the east coasts of Luzon and Formosa, branches off to the westward and passes through Luzon strait into the China sea. This water, turning south-westward, passes into the general monsoonal flow (*see* Figure 1).

The predominant direction during the South-west monsoon period is shown in Figure 3. The current which has come from the Java sea turns northward through Carimata strait, beginning to turn north-eastward in about lat. 5° N. The general flow is thence north-eastward towards and through Formosa strait. Some of this water passes north-eastward through Luzon strait to enter the Kuro shio.

Offshoots of the monsoonal currents enter the Gulf of Thailand and Tongking gulf.

The major current flows are therefore found in the western part of the China sea. The north-easterly current of the South-west monsoon, however, fills the whole of the sea between Hainan and Luzon (*see* Figure 3). During the North-east monsoon, the current westward of Luzon is flowing northward and north-westward, in opposition to the main monsoonal flow (*see* Figure 1). This current turns westward and south-westward across the sea and so passes into the main monsoonal flow. The northerly current west of Luzon comes partly from

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Chart 748b.

the eastern side of the China sea and partly from the North Equatorial current of the North Pacific ocean. A branch of the North Equatorial current passes into the Sulu sea and a part of this water emerges through Verde Island passage, south of Luzon, into the China sea.

It should be noted that even when the current of a particular monsoon is fully established, its rate and constancy and, to a lesser degree, its predominant direction, vary to some extent in successive months of the same monsoon. The rates shown for January in Figure 1 therefore refer only to that month, and a similar remark applies to the rates shown for August in Figure 3.

Seasonal changes of current.—After the transitional period of a monsoon wind, the general direction of current corresponding to the new monsoon is established, but the development of the greatest rate and constancy of the current is a gradual process.

The south-westerly current of the North-east monsoon runs during the period October to February. In December and January the current reaches its greatest rate and constancy.

March and April are months of transition (*see* Figure 2). The southerly current of the North-east monsoon period still persists in the southern part of the region, from the coast of Central Viet-Nam southward in March, and from about lat. 9° N. southward in April. Northward of lat. 22° N., south-westerly and north-easterly currents are experienced, the former predominating in March and the latter in April. Sets between north-west and north-east predominate between lats. 9° N. and 18° N. Between lats. 18° N. and 22° N., the current is mainly westerly.

The time of the onset of the South-west monsoon varies, so that in some years the currents may still be in a transitional stage up to about the middle of May. In average years, the north-easterly current of the South-west monsoon is established in May, except that in the neighbourhood of Hong Kong westerly currents still predominate over easterly ones. In June to August the current attains its greatest rate and constancy.

September is the transition month (*see* Figure 4). From about lat. 13° N. southward, the northerly and north-easterly current persists. This passes into a counter-clockwise circulation between lats. 13° N. and 22° N. North of lat. 22° N., the currents near the coast of China may set either north-eastward or south-westward. On the eastern side of Formosa strait, the current flows north-eastward.

Summary of Monsoon currents.—The following table gives the monsoon periods on various sections of the main shipping route in the China sea.

	Current of the South-west monsoon	Transition	Current of the North-east monsoon	Transition
Lat. 0° N. to 8° N. . .	May to September	—	October to April	—
Lat. 9° N. to 13° N. (Coasts of South and Central Viet-Nam)	May to September	—	October to March	April
Lat. 14° N. to 21° N. . .	May to August	September	October to February	March, April
Region of Hong Kong . .	June to September	—	October to May *	—
Western side of Formosa strait	April to August *	September	October to March †	—

* In March, April and May, about one-third of the currents set in the opposite direction.
† In March and April, about one-third of the currents set in the opposite direction.

Strength of current.—The following remarks on strength and constancy of current are based on observations received for the period

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Fig. 1. January

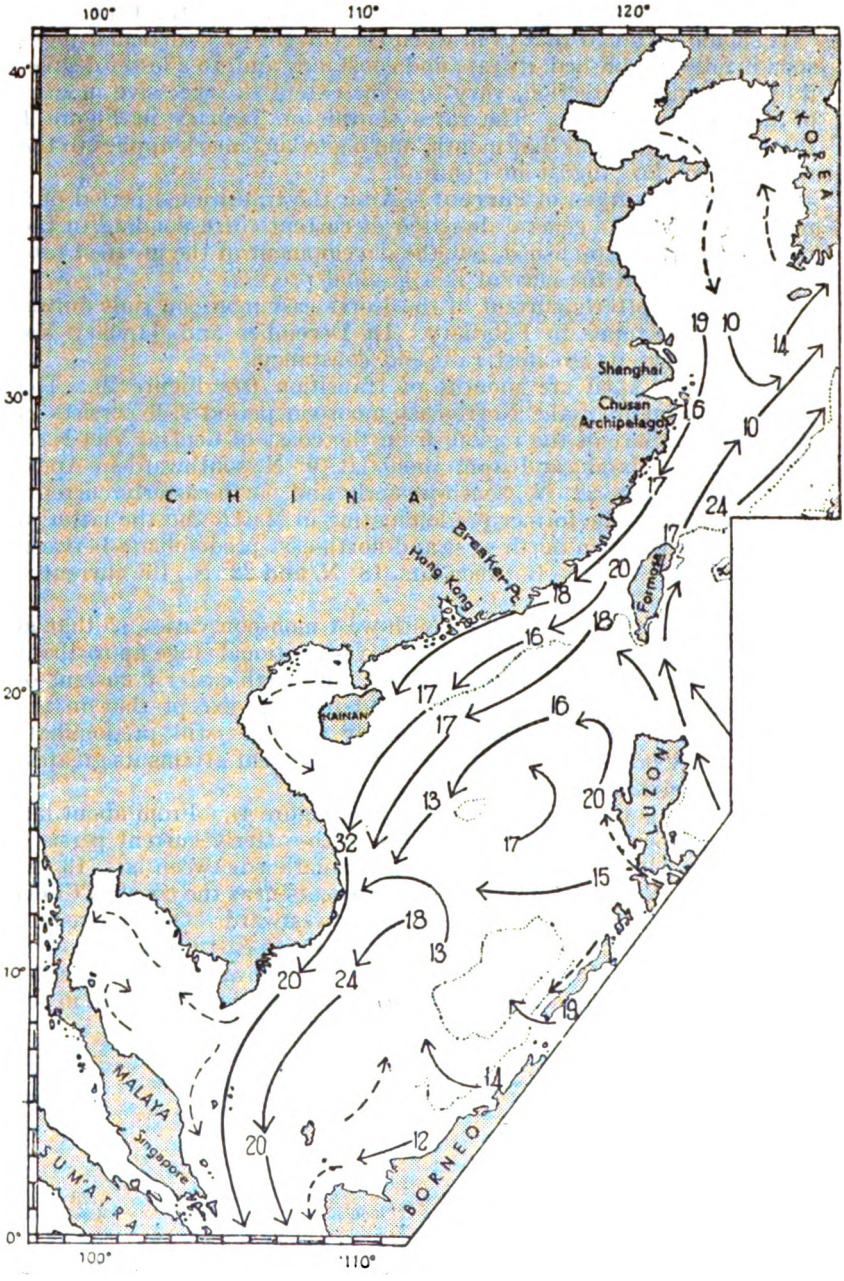

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Fig. 2. April

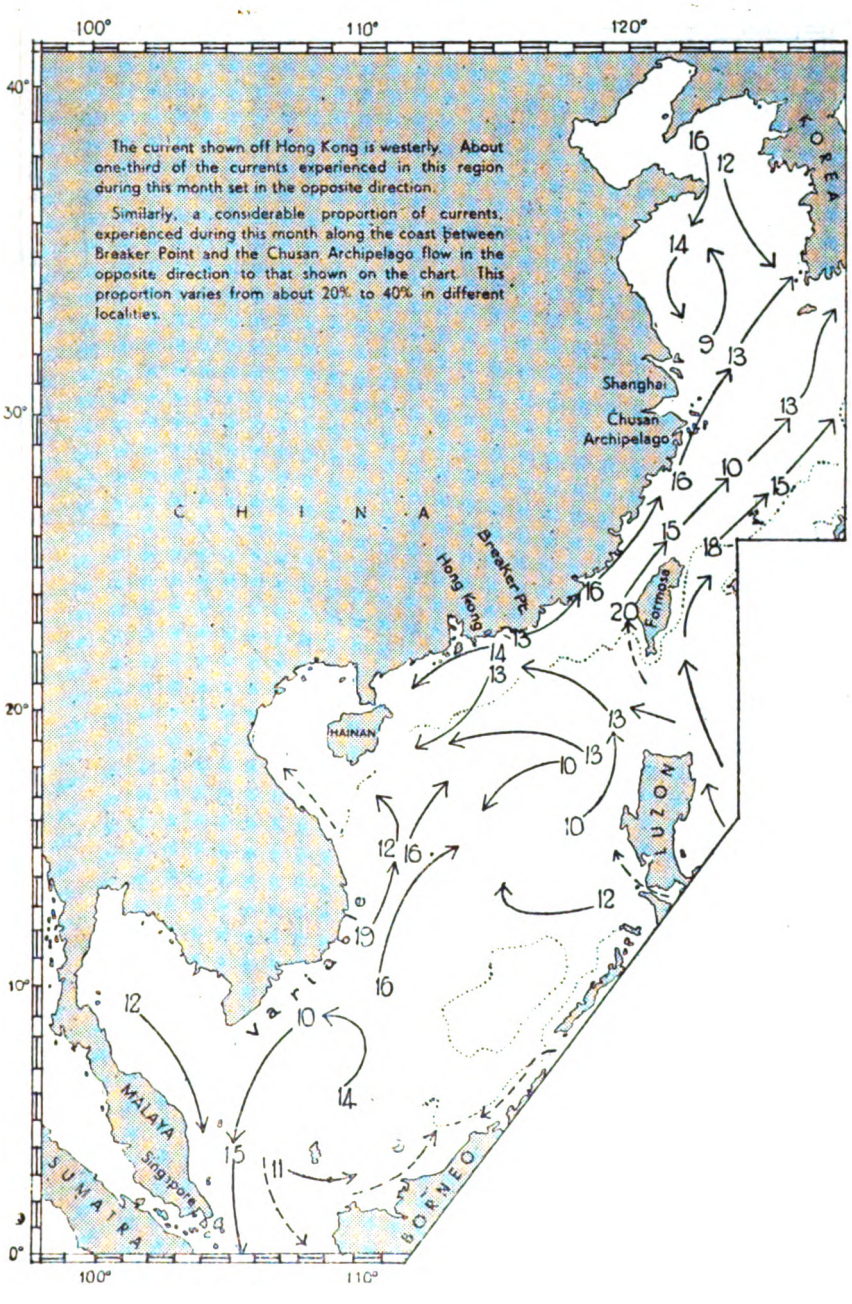

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Fig. 3. August

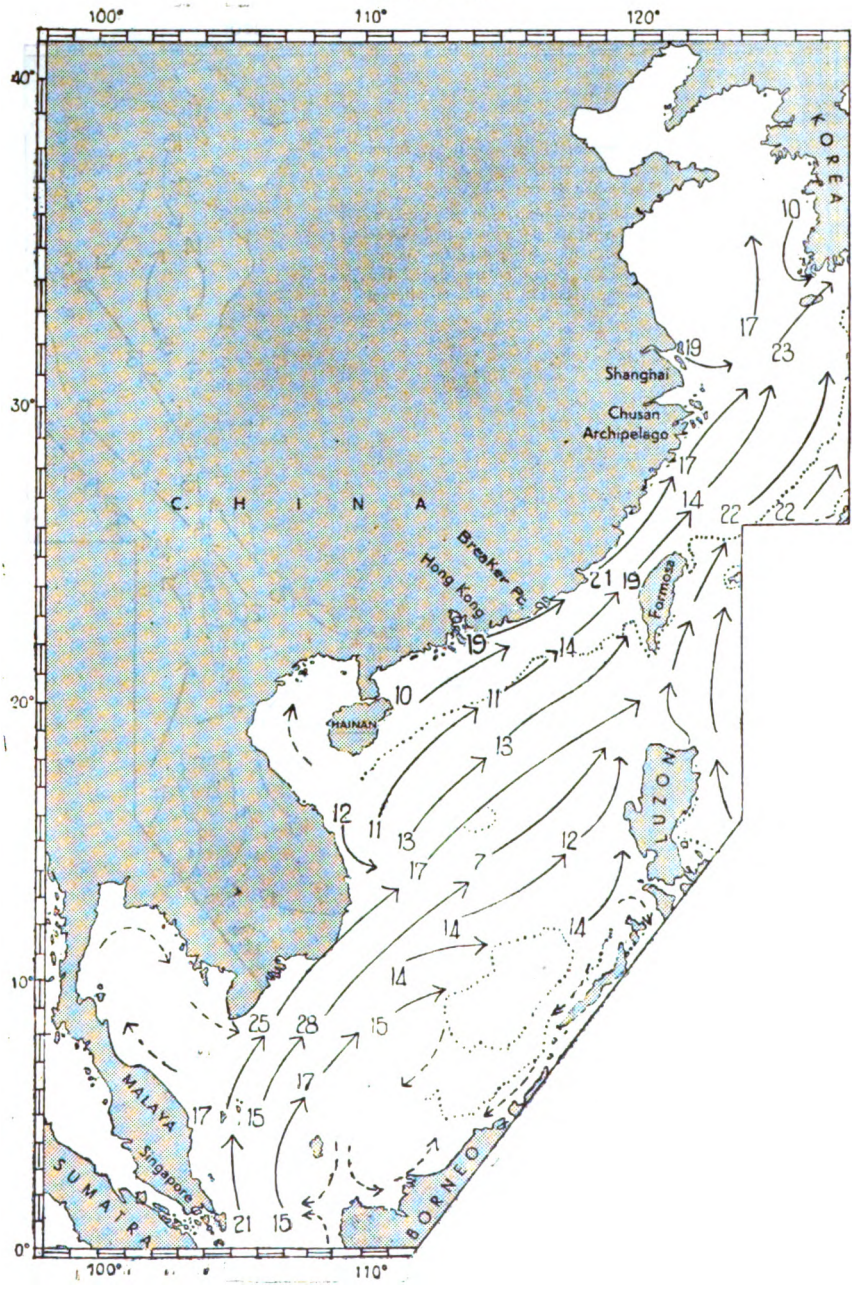

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Fig. 4. September

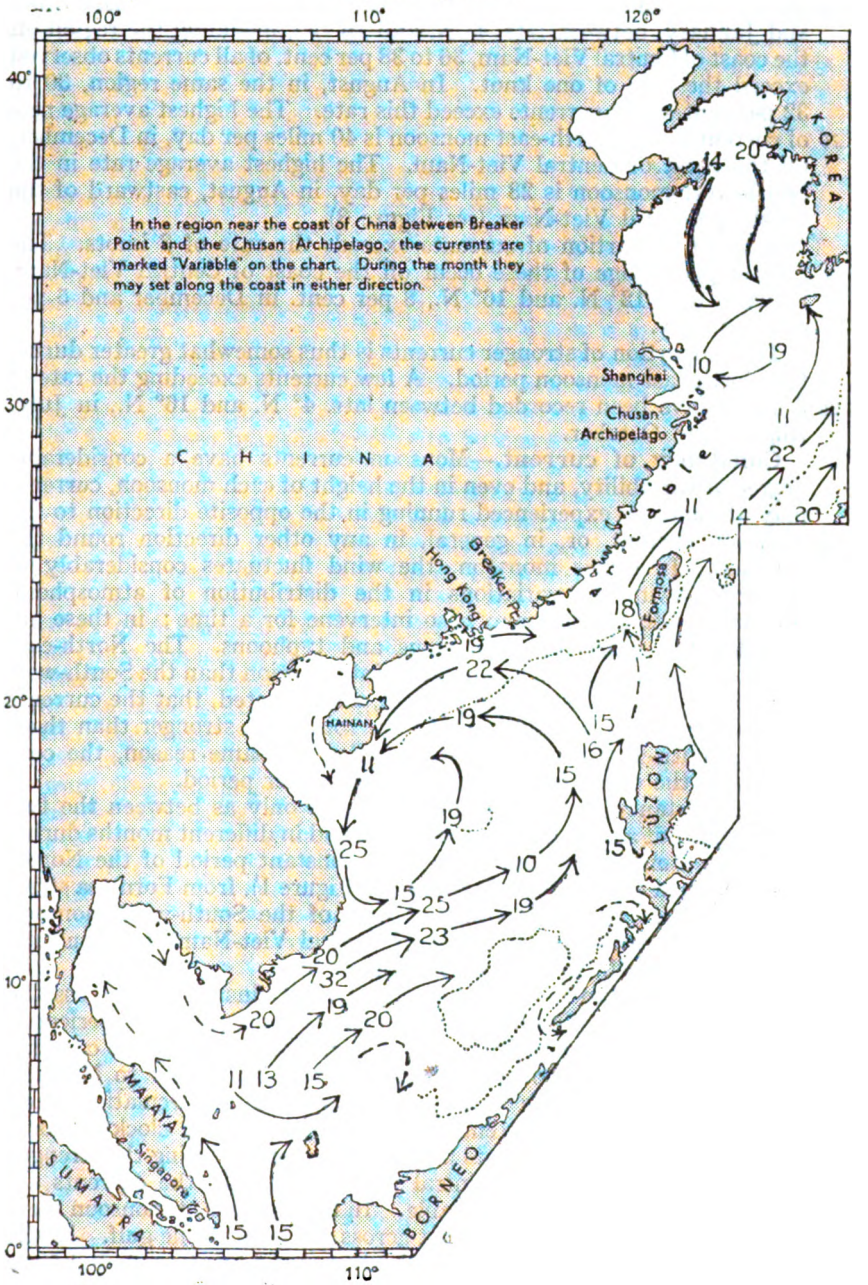

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Chart 748b.

1855 to 1939, and refer to the main flow of the monsoonal currents, on the western side of the China sea, southward of Hong Kong. A considerable proportion of currents in both monsoons exceeds the rate of one knot. During the height of the North-east monsoon, in December and January, between lats. 4° N. and 16° N., including the region off the coast of Central Viet-Nam, 36 to 38 per cent. of all currents observed exceed the rate of one knot. In August, in the same region, 30 to 32 per cent. of all currents exceed this rate. The highest average rate of current in the North-east monsoon is 40 miles per day, in December, off the coast of Central Viet-Nam. The highest average rate in the South-west monsoon is 28 miles per day, in August, eastward of the coast of Central Viet-Nam (*see* Figure 3).

A small proportion of currents exceeds the rate of 2 knots. The highest percentage of these occur off the coast of Central Viet-Nam, between lats. 12° N. and 16° N., 8 per cent. in December and 5 per cent. in July.

The proportion of stronger currents is thus somewhat greater during the North-east monsoon period. A few currents exceeding the rate of 3 knots have been recorded between lats. 4° N. and 16° N., in July, August and October.

Constancy of current.—Monsoon currents have a considerable degree of variability, and even in the height of each monsoon, currents may at times be experienced running in the opposite direction to the monsoon current, or, in general, in any other direction round the compass. In either monsoon, the wind fluctuates considerably in strength, owing to variations in the distribution of atmospheric pressure. Other winds may also intervene for a time; in these are included the winds of depressions and typhoons. The North-east monsoon is stronger and less liable to interruption than the South-west monsoon. This accounts for the fact, above stated, that the currents of the North-east monsoon period are somewhat stronger than those of the South-west monsoon period. For the same reason, the constancy of the currents is greater in the former period.

The constancy of the current varies not only as between the two monsoons, but also in different localities and in different months during the same monsoon period. The most constant period of the North-east monsoon current is in January (*see* Figure 1), from Formosa strait to lat. 4° N. The most constant part of the South-west monsoon current is eastward of the coast of Central Viet-Nam, between lats. 8° N. and 14° N., in August (*see* Figure 3).

Gulf of Thailand.—The currents of the China sea set across the mouth of this gulf in both monsoons and are consequently experienced in the neighbourhood of Pulau Redang and Pulau Obi. The currents in the gulf are not known in detail. During November to May the predominant set near the coast is a counter-clockwise circulation round the gulf; in June to September this is reversed to a clockwise one. Near the land, strong currents may be experienced during the strength of the monsoons. In the central part of the gulf, the currents are generally weaker and more variable. In the North-east monsoon there is frequently a strong westerly set across the head of the gulf. In the South-west monsoon a strong northerly current has been found from Hlaem Chong Prah to Ko Sattagoot.

Tongking gulf.—The currents in this gulf are also not known in detail. The direction of the current appears to be mainly with the wind, and, as a rule, parallel to the coast. It is, however, subject at

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Chart 748b.

times to sudden changes, and even to a complete reversal, for a few days. In the North-east monsoon, the predominant direction is counter-clockwise round the shores of the gulf. This direction may be found reversed to a clockwise one in April and May, but the clockwise circulation does not appear to continue throughout the South-west monsoon period, during which the current often emerges from the western side of the gulf in a southerly direction. The strength of current in the gulf is usually not great, but rates of from 2 to 3 knots have been experienced.

The eastern part of the China sea.—Eastward of the main shipping route in the western part of the sea, the number of available current observations is much fewer. In the region southward of about lat. 12° N., and eastward of the main flow of monsoonal current, the currents experienced are more variable throughout the year. The following remarks refer to the general trend of current in the open sea in this region.

In the South-west monsoon (*see* Figure 3), the north-easterly current in the western part of the sea sends off branches along its course, which set eastward, and subsequently south-eastward, into the eastern part of the sea. These branches appear to be more marked in June and July than in August.

In the North-east monsoon (*see* Figure 1), there appears to be a northerly trend of current which turns westward and passes into the main south-westerly flow in the western part of the sea.

For the currents off the west coasts of Borneo and Palawan, *see* China Sea Pilot, Volume II.

Effect of a tropical revolving storm on the current.—In the vicinity of a tropical revolving storm the set and drift of current may be markedly different from that normally to be expected. Comparatively little is known about such currents, particularly near the centre of the storm, since navigators avoid the centre whenever possible and conditions within the storm field generally are unfavourable to the accurate observation of current.

The primary cause of the currents is the strong wind associated with the storm. The strength of current produced by a given force of wind varies with latitude and is greatest in low latitudes. For the latitudes of tropical storms, say 15° to 25°, a wind of force 10 would produce a current of about one knot. It is believed that the strength of the currents of tropical storms is, on the average, the same as that which wind of similar force, unconnected with a tropical revolving storm, would produce. These currents, at the surface of the water, set at 45° to the right of the wind direction (in the northern hemisphere) and therefore flow obliquely outward from the storm field, though not radially from the centre.

Unless due allowance is made for these sets, very serious errors in reckoning may therefore arise. It is reported that, in one case, a vessel experienced a south-easterly set of more than 50 miles, under conditions when the set normally to be expected was south-westerly. In another case, an unexpected south-south-westerly set of 60 miles was experienced in 18 hours. These are examples of currents of abnormal strength, which are occasionally met in the vicinity of tropical revolving storms, and which cannot be accounted for by the wind strength. The possibility of such an experience should be borne in mind, particularly near, say within 100 miles of the centre of the storm.

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Chart 748b.

Other currents, not caused directly by the wind, may flow in connection with these storms but are probably weak and therefore negligible in comparison with the wind current.

The above remarks apply to the open ocean. When a tropical storm approaches or crosses an extended coastline, such as that of Florida, a strong gradient current parallel to the coast will be produced by the piling up of water against the coast. The sea level may rise by as much as from 8 to 15 feet (2^{m}4 to 4^{m}6) on such an occasion.

Whether the storm is in the open ocean or not there is a rise of sea level inwards to its centre which compensates for the reduction of atmospheric pressure. The extent of this rise is never great, from one to 2 feet (0^{m}3 to 0^{m}6) according to the intensity of the storm. It produces no current so long as the storm is not changing in intensity. If the storm meets the coast, however, the accumulation of water at its centre will enhance the rise of sea level at the coast mentioned above and so produce a stronger gradient current along the coast.

TIDES.—In the China sea the tides are of a predominantly diurnal character, and the principal changes follow the moon's declination rather than the moon's phases. Shortly after the moon crosses the equator, the diurnal tide vanishes and semi-diurnal tides occur; as declination increases, the diurnal tide increases, and, when the declination is near its maximum north or south, single day tides may occur. The semi-diurnal tide reaches its greatest amplitude (springs) shortly after new and full moon; its least amplitude (neaps) shortly after quadrature. The diurnal tide reaches its greatest amplitude shortly after the moon reaches its maximum declination, and vanishes shortly after the moon crosses the equator.

Day by day predictions of times and heights of high and low water for a large number of ports in the area are given in the Admiralty Tide and Tidal Stream Tables (Pacific Ocean and adjacent seas).

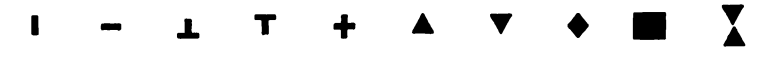
SIGNALS.—China Seas Storm Signal Code.—This code is used along the whole China coast, including Hong Kong, and the ports in French Indo-China.

GENERAL EXPLANATION.

This code is divided into two parts, typhoon warnings and gale warnings.

The purport of a signal, either for a typhoon or a gale, is indicated in the following manner:—There are ten symbols, indicated below, which in various combinations indicate latitude and longitude, and also form the following tables:—Table No. 1, Direction signals; Table No. 2, Condition signals; Table No. 3, Radius and Intensity signals; Table No. 4, Time signals; Table No. 5, Gale signals.

The following are the symbols in use:—



indicating the figures

1 2 3 4 5 6 7 8 9 0

2. The signals are displayed at the yard-arms and at the masthead of a Storm signal mast and have the following significance:—

Typhoon and depression signals:—

(*a*) 4 symbols at one yard-arm showing the position of the centre.

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(*b*) 3 symbols at the other yard-arm, showing the direction of motion or, alternatively, certain conditions; also the accuracy with which the centre has been located, and the intensity (Tables Nos. 1, 2 and 3).

(*c*) 1 symbol at the masthead showing the time at which the centre was in position indicated (Table No. 4).

Gale signals:—

(*d*) 1 symbol at one yard-arm showing the region threatened (Table No. 5).

(*e*) 2 symbols at the other yard-arm showing the general direction from which the gale is blowing, in points: 08 = East, 16 = South, 24 = West, 32 = North.

(*f*) 1 symbol at the masthead showing the time at which the gale was as stated.

3. The two upper symbols of group (*a*) indicate by their corresponding numbers the latitude, and the two lower symbols the longitude, of the centre of a circle (of a radius specified by the lowest symbol of group (*b*)) within which the centre of the typhoon or depression lies. The symbols for longitude give the tens and units only; thus 32 indicates longitude 132°.

4. The two upper symbols of group (*b*) indicate the direction in which the typhoon, etc., is travelling (Table No. 1) or, alternatively, certain conditions (Table No. 2).

Latitude (North).	Rate of travel in knots of typhoons in the Far East.							
	Before recurving.			After recurving.				
	Ordinary limits.	Mean.	Exceptional velocity as signalled.	Maximum recorded.	Ordinary limits.	Mean.	Exceptional velocity as signalled.	Maximum recorded.
° °								
5 to 15	5 to 12	9	11 or above	22	—	—	—	—
15 „ 20	5 „ 14	10	12½ „	24	5 to 17	10	13 or above	22
20 „ 25	7 „ 16	11	13 „	19	14 „ 23	17	21 „	30
25 „ 30	7 „ 13	11	13 „	15	11 „ 23	18	23 „	47
30 „ 35	—	—	—	10	11 „ 36	20	25 „	42
35 „ 40	—	—	—	16	12 „ 36	21	26 „	50
40 „ 45	—	—	—	—	17 „ 36	21	26 „	48
45 „ 50	—	—	—	—	12 „ 36	21	26 „	52
50 „ 55	—	—	—	—	12 „ 37	21	26 „	49

5. The third and lowest symbol of the group (*b*) indicates the radius of the circle whose centre is shown by the latitude and longitude, together with the degree of intensity or, alternatively, one of four conditions which can sometimes be given in addition to the

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direction of motion (Table No. 1) and in preference to the radius and intensity signal.

6. The only velocity signals given are " stationary or very slow," which is an alternative to the direction of motion, and " exceptionally high rate of travel " which may be given in addition to direction of motion.

In this connection the preceding table, extracted from the China Seas Storm Signal Code, will be useful.

TABLE No. 1 :—DIRECTION SIGNALS.

Two upper symbols of hoist.

Direction of motion.	Code figures.			
	Typhoon.	(a) Typhoon or depression.	Depression.	Anticyclone.
NNE . . .	0	6	0	3
	2	2	0	3
NE	0	6	0	3
	4	4	1	4
ENE . . .	0	6	0	3
	6	6	3	5
E	0	6	0	3
	8	8	5	6
ESE . . .	1	7	0	3
	0	0	7	7
SE	1	7	0	3
	2	2	9	8
SSE	1	7	1	3
	4	4	1	9
S	1	7	1	4
	6	6	3	0
SSW. . . .	1	7	1	4
	8	8	5	1
SW	2	8	1	4
	0	0	7	2
WSW . . .	2	8	1	4
	2	2	9	3
W	2	8	2	4
	4	4	1	4
WNW . . .	2	8	2	4
	6	6	3	5
NW	2	8	2	4
	8	8	5	6
NNW . . .	3	9	2	4
	0	0	7	7
N	3	9	2	4
	2	2	9	8
Unknown . . .	5	9	3	4
	3	3	1	9
Column . . .	2	3	4	5

(a) The word " typhoon " has been retained as it is in general use throughout the Far East. The word " cyclone " is in this case preferable.

The table serves for typhoons, depressions and anticyclones : also for the doubtful case : typhoon or depression.

The figures in the last two columns will not be displayed on the storm signal masts. They are for the " general inference " following a synoptic message. The display of the figures in column 3 is optional.

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7. *Caution.*—The position indicated by the latitude and longitude signals does not purport to be the position of the centre of the typhoon, but merely the centre of a circle of specified radius within which the centre of the typhoon is believed to lie.

TABLE No. 2:—CONDITION SIGNALS.

(Alternative to Table 1.)

Two upper symbols of hoist.

Typhoon.		Depression.		Anticyclone.	
Code figures.	Condition.	Code figures.	Condition.	Code figures.	Condition.
5 1	Forming.	7 3	Forming.	8 7	Forming.
5 2	Two centres.	7 5	Filling up.	8 9	Dissipating.
5 3	Direction unknown.				
5 4	Stationary or very slow.	7 7	Filled up.	9 1	Dissipated.
5 5	Curving N.	7 9	Stationary or very slow.	9 4	Spreading N.
5 6	,, NE.	8 1	—	9 5	,, E.
5 7	,, E.	8 3	V-shaped depression.	9 6	,, S.
5 9	,, SE.	8 5	No remarks.	9 7	Northern portion has moved eastward leaving a separate anticyclone over China.
6 1	,, S.				
6 3	,, SW.			9 8	Stationary or very slow.
6 5	,, W.			9 9	No remarks.
6 7	,, NW.				
6 9	Filling up or curving N.				
7 1	,, NE.				
5 8	Filling up.				
6 0	Filled up.				
Column	2	3	4	5	6

The figures in columns 3 and 5 will not be displayed on the storm signal masts. They are for the "general inference" following a synoptic message. 5

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8. In this code, the time signal (Table No. 4) shows the time at which the typhoon or depression was in the position indicated. The table has been expanded as observations are now available from certain stations at 1100 and 1700. Symbol No. 9 provides for occasions when the centre has been located from observations at other than routine hours.

TABLE No. 3:—RADIUS AND INTENSITY SIGNALS.

The lowest of three symbols.

(*b*) Code figures.	(*a*) A typhoon or a depression.		Anticyclone.	
	Radius of position circle.	Intensity, etc.	Radius of position circle.	Condition.
1	120′	Unknown.	150′	Feeble.
2	120′	Severe.	150′	Moderate.
3	60′	Unknown.	150′	Strong.
4	60′	Severe.	120′	Feeble.
5	—	Deepened.	120′	Moderate.
6	30′	Unknown.	120′	Strong.
7	30′	Severe.	—	Strengthening.
8	—	Exceptionally high rate of travel.	—	A vague area of high pressure.
9	—	Continental depression (*c*).	—	—
0	—	Position of centre uncertain.	—	Position of centre uncertain.

(*a*) The word "typhoon" has been retained as it is in general use throughout the Far East. Used in conjunction with the "intensity" signal the word "cyclone" would be preferable.

(*b*) The figures in Table No. 1 will indicate whether the figures in this column refer to a typhoon, a depression, an anticyclone or the doubtful case of "typhoon or depression."

(*c*) As there is no column for "continental depression" in Table No. 1, when this signal is sent, the direction of motion will be given by means of the figures in column 2 of Table No. 1, so as to maintain the practice of former years.

TABLE No. 4:—TIME SIGNALS.

Single symbol at masthead.

Day.	To-day.				Yesterday.				
Code figures.	1	2	3	4	5	6	7	8	
Time of 120th meridian, E.	0600	1100	1400	1700	0600	1100	1400	1700	Position deduced from supplementary information received since last warning.

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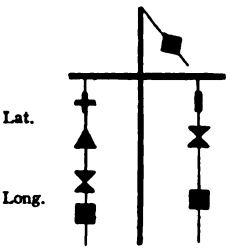
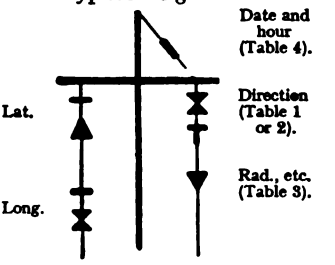
EXAMPLES.

Depression signal.



At 1700 yesterday, a continental depression, in Lat. 56° N., Long. 109° E., was travelling E.S.E.

Typhoon signal.



At 0600 to-day, a severe typhoon, within 30 miles of Lat. 26° N., Long. 120° E., is travelling N.E.

TABLE No. 5:—GALE SIGNALS.

One symbol at yard-arm showing the locality of the gale.

Code figures.	District.
1	Coast of Central Viet-Nam.
2	Tongking gulf.
3	Formosa channel.
4	Formosa to Yangtze.
5	Yangtze to Shangtung promontory.
6	Gulf of Pechili and Yalu gulf.
7	Sea of Japan.
8	North of Hokkaidō.
9	East Coast of Japan.
0	South of Kyūshū.

TABLE No. 6:—TYPHOON NIGHT SIGNALS

Central Viet-Nam (Annam) and China sea. Lat. 8° to 17°; Long. 106° to 120°.

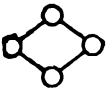
North Viet-Nam (Tongking) to Swatow. Lat. 17° to 24°; Long. 106° to 117°.

Formosa and approaches. Lat. 17° to 27°; Long. 117° to 126°.

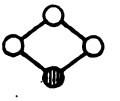
Tung hai and Hwang hai. Lat. 27° to 35°; Long. 120° to 128°.

Hopei to Korea. Lat. 35° to 42°; Long. 117° to 128°.

Southern Japan. Lat. 27° to 36°; Long. 128° to 140°.

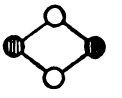


Sea of Japan. Lat. 36° to 44°; Long. 128° to 140°.

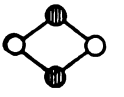


Hokkaidō and Sakhalin. Lat. 44° and northward; Long. 136° & eastward.

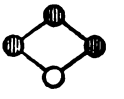
East of Japan. Lat. 28° to 44°; Long. 140° and eastward.



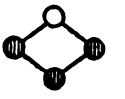
Pacific, S.E. of Liu Kiu islands. Lat. 17° to 27°; Long. 126° to 140°.



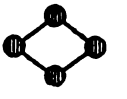
Pacific, S.E. of Bonin. Lat. 17° to 28°; Long. 140° and eastward.



Philippines and Pacific. Lat. 6° to 17°; Long. 120° to 138°.



Pacific, Yap, Guam. Lat. 6° to 17°; Long. 138° and eastward.



Threatening danger here and in the neighbourhood.

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TABLE No. 7:—GALE WARNING NIGHT SIGNALS.

Gale on the coast S. of Lat. 30°.

Gale on the coast N. of Lat. 30°.

These night signals are, at present, only shown from the time ball tower at Shanghai.

Local storm signals at Hong Kong.—In addition to the above general signals, local storm signals are displayed at Hong Kong, for which *see* page 497.

Thai waters.—Naval signals to merchant vessels.—Within Thai territorial waters merchant vessels may be signalled by Thai naval craft to stop, or to proceed in a certain direction for the purpose of search.

Signals for stopping vessels.—By day, the International Code flag "K" displayed by a naval patrol craft. By night, repeated short and long flashes will be made by naval patrol craft, or a rocket, from which a red flare is ejected, will be fired.

Vessels which do not stop in answer to these signals will be fired on.

Signals for directing vessels.—A naval aircraft, displaying the International Code flag "K," flying low around the vessel, and then proceeding towards a certain direction, indicates that the vessel must proceed in that direction. Vessels ignoring this signal will be warned by a burst of machine-gun fire directed ahead of the vessel.

Signal to be made by vessels when inconvenienced by searchlights.—In the event of the navigation of a vessel being inconvenienced by the glare from searchlights near a port in the British Empire, she should make the International code signal ZO (— — ·· — — —) by lamp and by whistle, siren or fog horn.

Both the light and sound signals should be employed, whenever possible, and should be repeated until the inconvenience is removed.

Only real urgency should necessitate the use of this signal, as unless the vessel is actually in the rays of a searchlight, it is not possible for the operators to know which projector is affected.

This signal is designed to assist mariners; no liability whatever will be admitted.

This signal should also be used in similar circumstances near ports in other countries.

Signals in Chinese ports.—The following signals can be made by flags in the International Code of Signals in Chinese ports:—

Flag	*Signification*	*At what port used*
B	Explosives onboard	All ports
N	Berthing officer wanted	Canton
G	Doctor wanted	All ports
G	Doctor required urgently	All ports
R	Water-boat wanted	Pakhoi and Hoihow
Y	Ash-boat wanted	Canton and Pakhoi
(over a black ball)		
NQ	Fire on board	All ports
ST	Police wanted	Canton

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CAUTIONS.—Thai submarines.—Thai vessels display a red triangular flag to denote that submarines, which may be submerged, are in the vicinity.

Air lights.—Mariners are warned that lights (with definite characteristics), which are not ordinary navigational aids, may be exhibited for the use of aircraft from structures near the coasts described in this volume.

These lights are often of great luminous power and altitude and may be the first lights or looms of lights sighted when making a landfall at night; they normally have the following characteristics:—

(*a*) *Flashing white* (revolving beam type).
(These lights are usually screened from seaward but their looms may be visible).

or (*b*) *Alternating flashing white and green* (revolving beam type).

or (*c*) *Flashing two letter groups* in the Morse Code, in *red* or *green*.
(Although the groups made by these lights may have definite meanings in the International Code of Signals, their signification is to be disregarded; the fact that they are *red* or *green* in colour, and flash with mechanical regularity, should prevent their being mistaken for signals from shore signal stations or ships).

Air lights which appear likely to be visible from seaward will be shown on charts and described in the Admiralty List of Lights. As they are subject to changes of which prompt notification to the mariner may not always be possible, care should be taken that they are not confused with marine navigational aids.

Fishing fleets.—Lights.—Enormous fleets of fishing junks may be met off the coast of China. As a rule the junks have their smallest sail forward; they are stoutly built, so that serious damage would probably be caused to an iron vessel in collision with one of them. The large trading junks have five masts, with two small sails aft.

Chinese junks do not carry the regulation lights.

Submarine cables.—The following articles are taken from the International Convention for the Protection of Submarine Telegraph Cables of 14th March, 1884:—

II. It is a punishable offence to break or injure a submarine cable, wilfully or by culpable negligence, in such manner as might interrupt or obstruct telegraphic communication, either wholly or partially, such punishment being without prejudice to any civil action for damages.

This provision does not apply to cases where those who break or injure a cable do so with the lawful object of saving their lives or their ship, after they have taken every necessary precaution to avoid so breaking or injuring the cable.

V. Vessels engaged in laying or repairing submarine cables shall conform to the regulations as to signals which have been or may be adopted by mutual agreement among the High Contracting Parties, with the view of preventing collisions at sea.

When a ship engaged in repairing a cable exhibits the said signals, other vessels which see them, or are able to see them, shall withdraw to or keep beyond a distance of one nautical mile at least from the ship in question, so as not to interfere with her operations.

Fishing gear and nets shall be kept at the same distance.

Nevertheless, fishing-vessels which see or are able to see a telegraph-ship exhibiting the said signals, shall be allowed a period of twenty-four

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hours at most within which to obey the notice so given, during which time they shall not be interfered with in any way.

The operations of the telegraph-ships shall be completed as quickly as possible.

VI. Vessels which see, or are able to see, the buoys showing the position of a cable when the latter is being laid, is out of order, or is broken, shall keep beyond a distance of one-quarter of a nautical mile at least from the said buoys.

Fishing nets and gear shall be kept at the same distance.

VII. Owners of ships or vessels who can prove that they have sacrificed an anchor, a net, or other fishing gear in order to avoid injuring a submarine cable, shall receive compensation from the owner of the cable.

In order to establish a claim to such compensation, a statement, supported by the evidence of the crew, should, whenever possible, be drawn up immediately after the occurrence; and the master must, within twenty-four hours after his return to or next putting into port, make a declaration to the proper authorities.

The latter shall communicate the information to the Consular authorities of the country to which the owner of the cable belongs.

Caution.—Cautionary notes appear on many charts, calling attention to areas in which there are submarine telegraph cables; these areas are indicated by pecked lines on the charts.

Every care should be taken to avoid anchoring in such areas, even though there may be no specific prohibition against so doing, in view of the serious interference with communications which results from damage to submarine cables. Equal care should be taken whenever the symbol for a submarine cable (a wavy line) is shown on the chart.

Danger involved in cutting a submarine cable to clear anchors or fishing gear.—In the event of any vessel fouling a submarine cable, every effort should be made to clear the anchor or gear by normal methods; should these efforts fail, the anchor or gear should be slipped and abandoned *without attempting to cut the cable. High voltages are, or may be, fed into certain submarine cables; serious risk exists of loss of life due to electric shock, or at least of severe burns if any attempt to cut the cable is made.* No claim in respect to injury or damage sustained through such interference with a submarine cable will be entertained.

Compensation for anchors or fishing gear sacrificed in order to avoid injuring a cable can be claimed under the Submarine Telegraph Act of 1885 (Schedule of Submarine Telegraph Convention, Article VII).

PILOTS.—French Indo-China.—Pilotage is compulsory within the limits assigned for each port in French Indo-China, except for sailing vessels of less than 100 tons and steam vessels of less than 150 tons.

China.—Chinese licensed pilot boats have the words "Licensed Pilot-boat," together with the boat's number, painted on the stern and on the head of the mainsail; they also display a yellow and green flag, upper half yellow.

Hong Kong.—Pilots for Macao, Canton and the Hsi chiang can be obtained at Hong Kong.

BUOYAGE.—French Indo-China.—The system of buoyage in French Indo-China is similar to that in force on the coasts of France, and is as follows:—

The term *starboard hand* means that side which would be on the right hand going with the main stream of flood, or in entering a har-

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bour, river, or estuary from seaward; the term *port hand* means the left hand side under the same circumstances.

Art. 1. Starboard hand buoys are painted red, surmounted by a cone, and have even numbers painted on them, commencing from seaward.

Art. 2. Port hand buoys are painted black, surmounted by a cylinder, and have odd numbers painted on them commencing from seaward.

Art. 3. Buoys at the bifurcation of channels are painted black and white in horizontal bands, and surmounted by a diamond.

Art. 4. Buoys at the junction of channels are painted red and white in horizontal bands, and surmounted by two cones, points together.

Art. 5. Buoys marking isolated dangers are painted red and black in horizontal bands, and surmounted by a ball.

Art. 6. Buoys marking wrecks are painted green, and surmounted by marks according to position, in agreement with Articles 1-5.

Art. 7. The names and numbers on the buoys are painted in white letters.

Note.—Warping and other buoys which are not part of the system are painted white.

China.—The following system of colouring buoys, beacons, and distinguishing marks of wreck-marking vessels is adopted in Chinese waters.

The side of the channel is to be considered starboard, or port, with reference to the entrance to any port from seaward.

Buoys coloured red mark the starboard side of the channel.

Buoys coloured black mark the port side of the channel.

Buoys painted in red and black horizontal bands mark the fairway, and should be passed close-to.

Buoys painted in red and black vertical stripes mark the ends of spits, and the outer and inner extremities of banks, shoals, or extensive reefs, where there is a navigable channel on either side of such bank, shoal, or reef. Vessels must not attempt to pass between a buoy thus painted and the danger it marks.

Buoys painted in red and black chequers mark rocks in the open sea, and also obstructions of small extent having channels on either side of them. When marking the latter, they are placed seaward of the danger. Vessels must not attempt to pass between a buoy thus painted and the danger it marks.

When two chequered buoys—red and white, and black and white—mark an obstruction, the red and white buoy marks the starboard side of the channel, and the black and white buoy marks the port side of the channel.

White buoys are used for surveying purposes, and in no way as aids to navigation.

Unless otherwise stated all buoys are conical.

All buoys carry the name of their district and station in English and Chinese.

Wreck-marking vessels by night exhibit a *fixed green* light over a *fixed white* light visible all round, and by day display a green flag.

Wreck-marking buoys are painted green, and when lighted exhibit a *green* light.

When a wreck lies in the open sea or in a position where there is plenty of room on either side of it, a wreck-marking vessel or buoy is in every case placed seaward of the wreck.

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When a wreck lies in a river, harbour, estuary, or confined channel, a wreck-marking vessel or buoy is placed on the channel side of the wreck.

Beacons marking channels and dangers are painted in a similar manner to buoys used for the same purpose.

The rules for painting beacons apply in each case to the body of the structure. When a beacon, painted a single colour, either red or black, is surmounted by a distinguishing mark, such mark may be painted the same colour as the body of the beacon, or with that colour and white combined, or white alone.

When the body of a beacon is painted in two colours, the same colours only are used for the mark surmounting it.

Beacons on land, erected to assist navigation, or to give lines of bearing for crossing bars or entering rivers, harbours &c., are painted so as to make them as conspicuous as possible. Red, black, and white are the only colours used.

FUEL.—Coal.—Large supplies of coal can be obtained at Bangkok and Hong Kong. Small supplies can be obtained at Saïgon, Hongay, Haïphong, Hoihow, and Macao. *See* also body of book.

Fuel oil.—Fuel oil can be obtained at Bangkok, Saïgon, Canton and Hong Kong; a small quantity can be obtained at Hoihow and Macao.

REPAIRS.—There are docks at Bangkok, Saïgon, Haïphong, Hong Kong, and Canton. Details of the largest dock at each port are given in Appendix I. Repairs to vessels and machinery can be carried out at these ports.

There are also naval dockyards at Hong Kong, Bangkok, and Saïgon.

RADIO STATIONS.—The following are the coastal radio stations in the area covered by this volume, which are open for public correspondence :—

Ko Sichang (Koh Sichang in list) and Bangkok in Thailand; Kuala Trengganu in Malaya; Saïgon, Tourane and Haïphong in French Indo-China; Macao (Macau in list) in Portuguese territory, and Cape D'Aguilar in Hong Kong.

For details, *see* List published by the General Secretariat of the International Telecommunication Union.

For details of radio stations which transmit weather bulletins, storm signals, navigational warnings, time signals, etc., *see* Admiralty List of Radio Signals.

STANDARD TIME.—All information regarding Standard times and summer times will be found in the Admiralty List of Radio Signals, Vol. II.

Time signals.—A visual time signal is made at Hong Kong and Macao. *See* Admiralty List of Lights, Vol. 6.

CONSULS.—British Consular officers are stationed at Singora and Bangkok in Thailand; at Saïgon and Hanoï in French Indo-China; and at Canton in China.

REGULATIONS.—Mine-sweeping operations.—For regulations for mine-sweeping operations, *see* Notice to Mariners, No. 10.

Thailand.—The following are extracts from a "Law on Navigation

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in Thai waters" which has been promulgated by the Thai Government, and which applies to all Thai territorial waters, and any harbours, anchorages, rivers and canals in the Thai dominions:—

17. Every Master of a merchant ship shall hoist her colours on entering Thai waters, and shall keep such colours displayed during daylight until the ship shall have been boarded by the Harbour master.

18. Every vessel entering Maenam Chao Phraya shall stop on arriving at the Guard Station at Samut Prakan (Paknam), and if necessary anchor there and allow the Health Officer and the Customs officials to come on board. Such Customs officials shall proceed in her to Bangkok, and remain on board until due permission to discharge shall be obtained, or until they shall be relieved by the Customs officials of Bangkok.

20. The Master of every vessel entering or going out of any port or river of the kingdom of Thailand, excepting Ko Sichang and Ang Hin, shall anchor at the guard station of such port or river, report his arrival to the officer of the station, and follow the instructions which that officer shall give him.

22. The Master of every foreign vessel that does not belong to a nation represented by a Consul, shall, within 25 hours (unless a Sunday or holiday intervene) after the arrival within the limits of the harbour of Bangkok, report the arrival of his ship at the Harbour master's office.

23. Such Master shall also deposit at the said Harbour master's office the ship's articles, a list of passengers, the ship's register, and a true copy of manifest if required.

24. The Master of a foreign vessel belonging to a nation represented by a Consul, shall lodge the said papers at the proper Consulate; he shall, however, on being boarded by the Harbour master or his deputy, fill up the book handed to him, giving at the same time a correct list of all passengers and an account of any accidents or deaths that may have happened during the voyage.

25. A copy of the harbour regulations shall be handed to the Master of every vessel in case he has not already been provided with the same.

41. A vessel wishing for the assistance of the Police shall display the signal ST of the International Code of Signals. If there should be mutiny on board the signal RX should be displayed.

68. In klongs and canals all boats going with the tide shall keep to the middle of the klong or canal; when going against the tide they shall keep close to the bank. When either of these courses is not possible they shall keep to the middle of the channel, observing local rules now existing or hereafter to be made in regard to navigation in klongs or canals.

99. Masters shall not swing vessels in rivers, channels, passages, or fairways, unless such river, channel, passage, or fairway be clear of vessels passing, or about to pass, in or out.

100. Masters of vessels proceeding into, or out of, harbours or narrow channels, shall cause the speed of such vessels to be kept as low as is consistent with the most prudent navigation, due regard being had to the vessel's safety.

101. Masters of steam vessels going through canals shall go at a slow speed, not exceeding 4 miles an hour, and, when crossing the fairway, shall not pass within 100 metres (about 100 yards) of the bow of any steamship going up or down the river.

122. No steamship or steam launch, either at anchor or under way, shall use her whistle except for the purpose of navigation or to avoid

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collision, nor shall the signal be unduly or wantonly prolonged. The same rule shall apply to the sound signal of motor-boats.

131. Masters of vessels are requested to inform their crews, when granting them leave, that they are not to land with sheath knives or other dangerous weapons, such as slung shots, &c.

Dangerous goods—189. By "dangerous goods" are understood aquafortis, vitriol, naptha, benzine, explosives, gunpowder, lucifer matches, nitro-glycerine, petroleum, and other goods of a dangerous nature.

190. Any vessel on entering any Thai harbour or river having on board dangerous goods, and any vessel about to take on board any dangerous goods, shall anchor at such place in the harbour or river as shall be pointed out by the Harbour master or his deputy; and the said vessel shall not be removed therefrom without the permission of the Harbour master.

191. The transhipment of any dangerous goods, as aforesaid, shall not take place between the hours of sunset and sunrise, without the written permission of the Harbour master.

193. When any dangerous goods are being transhipped, shipped, landed, or moved from one place to another by water, within the limits of harbours or anchorages, they shall be conveyed in a covered boat, lorcha, or vessel, and covered with tarpaulin; in the case of a cargo of naptha or benzine, this covering must be of wood. Such boat, lorcha, or vessel shall display a rectangular red flag not less than 80 cm. by 45 cm. (about 2½ feet by 1½ feet) in size; no lights, fire, or smoking shall be allowed on board. Such boat, lorcha, or vessel shall proceed without delay or interruption, and shall not anchor or stop at any place except for the immediate purpose of landing such goods.

Petroleum.—197. In these rules the words "Petroleum in Bulk" shall mean petroleum and any product of petroleum other than lubricating oils, in any vessels, tank, compartment, or receptacle having a capacity of 800 gallons and upwards, and the words "Tank Ship" shall mean any ship or boat conveying or intended to convey petroleum in bulk.

198. Every tank ship arriving in Thai waters, having on board petroleum in bulk, and every ship being about to take on board such petroleum from premises licensed for storing petroleum in bulk, shall display a red flag at her foremast head, and at her mainmast head shall display the flags RKO of the International Code of Signals (signifying "Petroleum Oil"), and shall keep such flags flying during the hours of daylight whilst any petroleum is on board, and thereafter so long as she shall remain in Thai waters, and during the same period every such ship shall by night display two *red* lights, horizontally disposed, in a position where they can be best seen, and at a height of not less than 20 feet (6^{m}1) above the deck. Provided that if the Harbour master is satisfied that a ship after discharging the petroleum on board has been thoroughly emptied, cleaned, and ventilated, he may dispense with the requirements of this rule.

199. Every tank ship arriving at a Thai port or river, having on board petroleum in bulk, shall proceed at once to the wharf licensed for landing petroleum in bulk, and she shall not remove from such position without the permission of the Harbour master.

201. The Master of every tank ship arriving at a Thai port, and having on board petroleum in bulk shall, on entering his vessel inward, and before proceeding to discharge any cargo, declare in writing to the Harbour master:—

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(*a*) The quantity of petroleum the ship is carrying.
(*b*) The number of compartments or tanks in which oil is stored.
(*c*) The nature and quality of the oil, and whether it is covered by any, and what, certificate from the port of shipment or any intermediate port of call as to the temperature at which the oil gives off an inflammable vapour.

202. Upon such a declaration being received, and after due compliance with the requirements of the Customs, the Harbour master may give permission to the ship to proceed at once to discharge the petroleum as hereinafter provided.

Telegraph cables.—209. Every telegraph, telephone or electric light cable established or to be established in future across the Maenam Chao Phraya, or any other river, shall be marked at either end by posts, carrying a large white circular disc, bearing the words, " Cable.—Don't drop or drag anchor " in Thai and English characters.

No vessel of any description shall anchor within 100 metres (about 100 yards) of either side of this cable, nor shall they drag their anchors across it.

211. As far as concerns these regulations, vessels of any description shall be considered to be dragging their anchors, if such anchors are not visible above water at the time such vessels are passing the limits forbidden by these regulations.

Quarantine.—218. The following are hereby declared to be the quarantine anchorages in Thai waters :—

Abreast the Customs station at Ko Sichang.

Abreast the Customs station at Samut Prakan in the Maenam Chao Phraya.

Abreast the police station at Bangkolem at Bangkok.

219. The quarantine station is at such place as may hereafter be appointed.

220. The Master or person in charge of any vessel arriving at or being in Thai waters, having on board, or having had on board within 14 days previous to arrival, cases of plague, cholera, smallpox, fever, or other infectious disease of a dangerous nature shall, if arriving within Thai waters, display the quarantine flag, and proceed forthwith to the quarantine station, and there remain until released by the Health officer. If any such cases shall occur after a vessel has arrived in Thai waters, the Master or person in charge shall forthwith display the quarantine flag, and remove his vessel to a place approved by the Health officer.

223. All vessels in quarantine shall display by day the usual quarantine or yellow flag at the foremast head with the International Code pendant under it, and by night at the foremast head a *red* light.

224. All guard boats shall display a similar yellow flag at the stern by day, and from sunset to sunrise a light at both the bow and the stern.

Regulations for approaching French territorial waters in time of war.—Decree of 1st October, 1934.

1. In time of war the conditions under which vessels, other than French war vessels, may enter and remain in ports and anchorages of France, her colonies, protectorates, and mandated territories, are governed by the following regulations.

2. No foreign vessel-of-war or merchant vessel may approach within 3 miles of the coast in the territorial waters of France, her colonies, protectorates, or mandated territories without permission without running the risk of being destroyed.

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3. Every vessel affected by the present decree must display her national flag on approaching the prohibited zone, and also her number in the International Code of Signals; at night, she must show her navigation lights.

If desirous of entering the prohibited zone in order to reach a port, permission must be asked as follows:—

By day, by displaying the pilot flag (G flag of the International Code of Signals) accompanied, if possible, by the signals PT of the International Code of Signals (I require a pilot) made in Morse code by searchlight.

By night, by making the signal PT (I require a pilot) in Morse code, followed by her number in the International Code of Signals, or, if she has no means of doing this, by making the night signal for a pilot in accordance with the International Code of Signals, viz. a *white* light flashed or shown just above the bulwarks at short or frequent intervals for *about a minute* at a time, accompanied if necessary by a *blue* light *every fifteen minutes*.

The vessel must remain outside the zone until she has received a reply from a signal station or an examination vessel.

The reply from the signal station or the examination vessel is made as follows:—

Entry permitted:

By day, by searchlight, in Morse code, repeated three times, or flags UI of the International Code of Signals.

By night, by searchlight or flashing light, UI, in Morse code, repeated three times, or by a *white* Very's light.

Entry forbidden:

By day, by searchlight, UJ in Morse code, repeated three times, or flags UJ of the International Code of Signals.

By night, by searchlight or flashing light, UJ in Morse code, repeated three times, or by a *red-green* Very's light.

If permission is granted, the vessel must enter the prohibited zone at reduced speed, displaying by day flag G of the International Code of Signals, and by night exhibiting her navigation lights, and must steer for the examination vessel. The latter has normally no distinguishing marks, but, if she wishes to show vessels in sight that she is engaged on examination duties, she displays at her masthead a black ball by day and a *red* light at night, or alternately, she will make MAJ, in Morse code, three times by flashing light.

If entry is refused, the visiting vessel must immediately alter course and proceed for some other anchorage.

5.—In foggy weather every vessel affected by the present decree, desirous of entering the forbidden zone, is to display the same signals as in clear weather and sound blasts on the whistle or siren until permission to enter has been given by an examination vessel.

6. Every vessel affected by the present decree must immediately comply with the orders of a war vessel or examination vessel, or a signal station. These are given either by a warning gun or by a signal of the International Code of Signals.

Any vessel warned by a battery or war vessel must immediately alter course more than eight points (90°), and steer so that she remains in sight of signals from the war vessel or the signal station nearest to the battery that warned her. She may not proceed on her former course until authorised to do so.

If the vessel does not alter her course after a blank charge has been fired to warn her, a live shell will be fired a few minutes later

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and if a vessel does not immediately conform to this order, effective fire will be opened on her.

In urgent cases the warning by the firing of a blank charge may be omitted.

At night the warning shot with live shell may also be omitted, and any vessel entering the prohibited zone without permission is liable to be destroyed without preliminary warning.

7. Vessels authorised to enter roads and ports in France, or in the French colonies, protectorates, or mandated territories, must keep strictly within the approach channel.

For this purpose they will be piloted by a vessel set apart for this duty. Should a port have no pilotage vessel, the examination vessel will send a pilot on board the visiting vessel.

Vessels must take up the berths assigned to them and conform strictly to the special regulations in force.

The length of stay of a vessel will depend on military considerations, and when circumstances require it a vessel may be ordered to put to sea or to move to another port; such order must be carried out without delay, though respite may be allowed to vessels really unable to conform to it immediately.

No vessel is to get under way, either to change berth or to quit the roads, without the permission of the local authority; a request may be made by hoisting G flag of the International Code of Signals.

8. In naval roads and ports, between sunset and sunrise, the movement of boats, other than those of French war vessels, is absolutely forbidden.

From sunrise to sunset, movement is only allowed to boats which have received a special permit and means of identification from the naval authorities.

Boats with permits should keep clear of war vessels if ordered to do so, and cannot in any case go alongside the latter without their permission. The movement of these boats will moreover remain subject to local regulations, notably those relative to the prohibition to enter certain parts of the roadstead, and to go alongside at any other place than those expressly notified.

In commercial ports similar measures will be taken by the local authority to impose the restrictions judged necessary on the movement of boats, due consideration being given to the interests of commerce.

9. Visits by neutral war vessels are governed, in time of war as in time of peace, by the decree of 29th September, 1929, so far as notification or previous authorisation is concerned the regulations for entry being governed by the present decree.

10. The measures provided for by the present decree are to come into force on mobilisation or on special notice.

11. Any infraction of the present decree will lead to such repressive measures as circumstances admit of, in addition to the risks of destruction incurred.

Chinese inland waters.—Regulations are in force with regard to the lights to be carried by vessels, sound signals to be made, and other subjects relating to the navigation of vessels in Chinese inland waters. Masters of vessels should make themselves conversant with these regulations.

QUARANTINE.—Chinese regulations.—The following are extracts from the regulations which have effect in the ports of China

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where the Health Services are under the control of the Ministry of Health.

2. The Minister may on the recommendation of the Director of Quarantine :

(*a*) Declare that any place within or beyond the Republic of China is infected with a quarantinable disease, or that a quarantinable disease is liable to be brought or carried from or through that place, and thereupon and for so long as such declaration remains in force that place shall be a *proclaimed place* within the meaning of these regulations. Public notification of every such declaration shall be made by the issue of a Harbour notification and by advertisement in the newspapers.

(*b*) Declare any port in the Republic of China to be a first port of entry for vessels coming from a proclaimed place and require masters of such vessels bound for China to enter a port so declared before entering any other Chinese port except in case of danger or for other sufficient reason.

(*d*) In consultation with the Harbour Authorities appoint places to be quarantine anchorages for vessels subject to quarantine inspection.

3. The Minister of Health shall prescribe the limits within a port to be used as quarantine anchorage.

4. The Master of any vessel subject to quarantine inspection shall, on arrival at a port to which these regulations apply, bring the vessel to the place appointed to be a quarantine anchorage.

5. (*a*) The hours of quarantine inspection of vessels shall be from sunrise to sunset, and during these hours the Quarantine Officer shall board every vessel requiring inspection as soon as possible after her arrival.

(*b*) The Quarantine Officer may on application inspect any vessel between sunset and sunrise if he is satisfied that the conditions on board, including lighting, will enable such inspection to be effectively performed.

6. The Master of any vessel subject to quarantine inspection shall, whenever possible, supply the Quarantine Officer by radio at least three hours previous to her arrival at the quarantine anchorage with the following information :—

(*a*) The name of the vessel and the expected date and hour of her arrival.

(*b*) 1. Number of passengers on the vessel.
2. Number of crew on the vessel.
3. Number of passengers landing at the port.

(*c*) Name of oversea port of departure and name of last port of call.

(*d*) Number of cases of infectious disease during the last 15 days, or of deaths during voyage (stating name of diseases).

(*e*) Number and nature of any cases of non-infectious disease.

(*f*) Whether a ship's surgeon is carried.

7. For the purpose of these regulations the quarantinable diseases shall be : Plague, cholera, smallpox, typhus fever and yellow fever, and any other disease which may be prescribed by the Minister.

12. The Master of every vessel coming from a proclaimed place shall on arrival furnish to the Quarantine Officer as complete a list as possible of all passengers on board, and the full address, where obtainable, of any person who intends to disembark at the port.

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14. The following vessels shall be subject to quarantine inspection on arrival:

(*a*) Every vessel which comes from a foreign port, unless exemption has been granted.
(*b*) Every vessel which comes from a proclaimed place.
(*c*) Every vessel which has infectious disease on board or on which a death has occurred since the last quarantine inspection.

15. The Master of every vessel subject to quarantine inspection shall

(*a*) Display the quarantine signal on his vessel before she comes within one league of the port.
(*b*) Keep the quarantine signal displayed on his vessel until pratique has been granted.

16. The Quarantine signal shall be by day the displaying of the yellow flag "Q" at the foremast head, and by night, if in quarantine or if inspection has been arranged, the exhibiting of three *red* lights, vertically disposed, not less than six feet (1m8) apart; and when awaiting inspection, the sounding of three distinct prolonged blasts on the whistle repeated at intervals.

17. No unauthorised person shall go on board or alongside any vessel while the quarantine signal is displayed on the vessel.

24. Except in case of danger no Master of a vessel arriving at any port or place in China to which these regulations apply, and no person on board thereof, shall communicate, or attempt to communicate, with the shore or with any other vessel, and no person from the shore or from any other vessel shall communicate with such vessel otherwise than by signal until pratique has been granted. Provided that nothing in this Section shall prevent any pilot or other duly authorised officer from coming alongside or boarding any such vessel.

47. A Quarantine Officer may, by order in writing, order into quarantine any vessel, person, goods or articles being or likely to be infected with a quarantinable disease. When a vessel is ordered into quarantine, the Master thereof shall forthwith cause the vessel and all persons and goods on board the vessel to be conveyed to such mooring grounds or to such quarantine station as the Quarantine Officer directs.

48. When a vessel is in quarantine, then until the vessel is released from quarantine no unauthorised person shall land or unship, or move with intent to land or unship, any goods from the vessel. All persons ordered into quarantine shall perform quarantine, and for that purpose may

(*a*) Be detained on board the vessel.
(*b*) Be removed to and detained in a quarantine station until released in accordance with these regulations.

49. Where a vessel is ordered into quarantine in a port which has not the equipment necessary to receive it, the Quarantine Officer may order the Master to proceed to another port suitably equipped to carry out the necessary measures of quarantine.

Deratisation.—In accordance with Article 28 of the International Sanitary Convention of 21st June, 1926, Deratisation can be carried out, and Deratisation and Deratisation exemption certificates can be issued to vessels at the following ports:—Haïphong, Saïgon, and Hong Kong.

Certificates of Deratisation can be issued to vessels at Bangkok.

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Chart 1263.

PASSAGES.—General remarks.—Information with regard to passages through the China sea, generally, will be found in the Admiralty publication "Ocean Passages for the World." In this volume some of the intermediate local passages only are described. Vessels are recommended to follow the routes shown on the charts of the China sea as far as practicable.

The "Dangerous Ground" mentioned on page 1 should be avoided.

Fishing fleets should be avoided. *See* page 25.

Chart 2414.

Saïgon to Bangkok.—From Saïgon the recommended route is to pass within Pulau Condore and The Brothers at all times of the year, and to give a wide berth to Pulau Obi and the shoals off Pointe Camau (Kamau).

During the South-west monsoon, from off Pointe Camau the route is westward of all the dangers in the fairway of the Gulf of Thailand until in about lat. 10° 40′ N.; a certain amount of shelter is afforded by keeping towards the western side of the gulf. From westward of Koik rock (page 155) a course may be steered direct for Ko Luem (*Lat. 12° 57′ N., Long. 100° 38′ E.*), passing within sight of Ko Chuang light, thence direct to the bar lighthouse of Maenam Chao Phraya.

During the North-east monsoon, a vessel, from off Pointe Camau, should steer north-westward between the Pulau Panjang group and the islands southward of Phu Quoc (Koh Tron), thence passing a few miles westward of Ko Rong and Ko Samit; thence she should steer to pass south-westward of Rocher Kusrovie, thence for Ko Chuang lighthouse, passing south-westward of Victory shoal; or she may proceed northward along the coast, passing westward of Ko Kut and Ko Chang, and thence northward or southward of Victory shoal; thence she should pass southward of Ko Chuang lighthouse, thence steer to pass on either side of Ko Luem, and thence to the bar lighthouse.

Chart 2661a.

Hainan to Hong Kong.—Low powered steam vessels bound from Hainan strait to Hong Kong, finding the North-east monsoon strong, may, on clearing the banks, shape course for Tien pak (page 442), on nearing which, the wind and sea usually moderate. They should then pass northward of Huang-ch'ing (Round island) by day, or outside Mandarin's Cap by night, and close past Wei-chia shan (Waikaup island), when they can haul up for Tawan shan (Great Ladrone island). Fine weather will generally be experienced between Nau chow and Shang-ch'uan shan.

Chart 1263.

CLIMATE AND WEATHER.—General remarks.—Articles 1, 2, 3 and 4 in the General Meteorology section of the preliminary pages are appropriate to this Pilot.

The climate of this region is hot, except north of about latitude 20° N. from about December to February.

The North-east monsoon begins in September in the north, and in November or December in the south. It continues until about the end of April except southward of about latitude 5° N. and in the Gulf of Thailand, where it ends earlier. Eastward of South Viet-Nam (Cochin China) and over the open sea farther north, this monsoon normally reaches gale force on several days per month from October to February.

During the South-west monsoon, which prevails from June to August or September, there are few gales, and these are generally associated

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Chart 1263.

with typhoons. This monsoon is in general the wettest season in the north, but in the south there is nearly everywhere most rain from September to December or January.

On an average about nine typhoons affect some part of this region in a year, and most of these come between June and November, but on an average only one of them occurs south of latitude 15° N., and this nearly always happens in November or December.

Fog is not uncommon from January to April in the Tongking gulf and east-north-eastward of Hainan, both on the coast and at sea.

Pressure.—During the northern winter the semi-permanent Asiatic anticyclone, which is often centred over Mongolia, lies to the north of the region covered by this volume. It normally begins to form early in September, and does not disappear until May. The greatest intensity is reached in January, when mean pressure is above 1035 mb. near the centre.

From May to August an area of low pressure is normally centred over northern India, with extensions westward to northern Africa and eastward to China. The alternation of the monsoons is associated with these seasonal changes of pressure.

These average conditions are subject to large variations, often caused by moving depressions. The Asiatic winter anticyclone varies greatly in intensity and may be displaced two or three thousand miles eastward or westward of its average position. The position and extent of the low pressure area of summer also varies considerably. Nevertheless the great annual change from high to low pressure over Asia gives an annual variation of mean pressure throughout the region covered by this volume, a variation which is greatest in the north, and decreases southward to about one millibar near the equator. At Hong Kong (*Lat. 22° N.*) the mean in January is about 1020 mb., and in July about 1005 mb.; at Bangkok (*Lat. 14° N.*) the corresponding means are about 1013 mb. and 1007 mb., and near Singapore 1010 mb. and 1009 mb.

Depressions rather like those of western Europe and the U.S.A. (*see* standard article on Lows, page xxxviii) cross China, and occasionally Indo-China, from time to time, and sometimes follow tracks sufficiently far south to affect the northern part of the region covered by this volume. Although they occur in all months they are most frequent from October to June, and especially from March to May. They generally move east, or slightly north of east, across the mainland, and after crossing the coast turn towards east-north-east and later towards north-east. Their rate of travel averages about 20 to 30 knots, but is occasionally 40 knots or more. There are generally 30 or 40 such depressions in a year.

The principal difference between them and the depressions of western Europe and the U.S.A. is that in the Chinese depressions the cold front is generally much more in evidence than the warm front, and instead of southerly winds ahead of the centre there is normally only a weakening of the North-east monsoon.

Variations in the distribution of pressure are associated with considerable fluctuations in the strength of the monsoons; during the North-east monsoon an increase of pressure usually accompanies an increase in the strength of the north-easterly wind. Shallow depressions that form over the China sea also cause local variations of wind.

In addition to the variations of pressure due to the depressions

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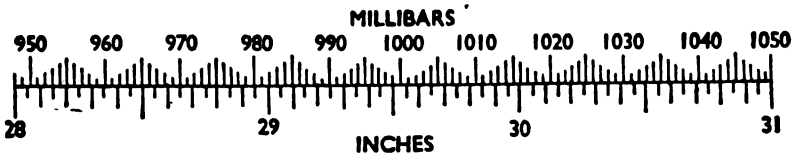
Chart 1263.

described in the previous paragraph and to typhoons (*see* page 49) there is a regular diurnal variation with maxima at about 1000 and between 2200 and 2400, and minima at about 0400 and 1600, local time, and a range of about 3 or 4 mb.

The following table gives the correction in millibars to be applied at sea to the barometric pressure at each hour, to allow for the diurnal variation :—

Local time.	Lat. 0°–10° N.	Lat. 10° N.–20° N.	Local time.	Lat. 0°–10° N.	Lat. 10° N.–20° N.
0000	− 0·6	− 0·5	1200	− 0·7	− 0·5
0100	− 0·1	− 0·1	1300	0·0	+ 0·1
0200	+ 0·4	+ 0·4	1400	+ 0·7	+ 0·7
0300	+ 0·7	+ 0·7	1500	+ 1·3	+ 1·2
0400	+ 0·8	+ 0·7	1600	+ 1·5	+ 1·3
0500	+ 0·7	+ 0·5	1700	+ 1·5	+ 1·2
0600	+ 0·2	+ 0·1	1800	+ 1·1	+ 0·9
0700	− 0·3	− 0·4	1900	+ 0·5	+ 0·3
0800	− 0·9	− 0·8	2000	− 0·2	− 0·2
0900	− 1·3	− 1·2	2100	− 0·7	− 0·7
1000	− 1·4	− 1·2	2200	− 1·0	− 0·9
1100	− 1·2	− 1·0	2300	− 0·9	− 0·8

The diagram below shows the equivalent of millibars in inches and vice-versa :—



Wind.—*North-east monsoon.*—The North-east monsoon is much stronger and more persistent than the South-west monsoon, the former rarely being interrupted over the open sea, while the latter is sometimes very irregular and is often weak. In both monsoons the interruptions usually take the form of easterly or south-easterly winds, and such winds may last for a day or two at a time.

Predominant winds in the North-east monsoon are shown in Figure 1 and percentage frequency of winds of Beaufort force 7 or more in Figure 3. In the north about half of the latter are winds of force 8 or more.

In Figures 1 and 2 the arrows show the direction of the predominant wind, if its constancy is at least 51%, according to the following scheme :—

A large proportion of the gales and strong winds of the North-east monsoon are associated with the arrival of cold air from some northerly point in the rear of a depression, and are often accompanied by a rising barometer. There are occasional squalls with the cold fronts that occur in these circumstances, in addition to the prolonged periods of strong wind or gale. Squalls associated with thunderstorms are not uncommon south of about latitude 15° N. during the latter part of the

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Chart 1263.

monsoon, and even during the height of the monsoon around Singapore strait.

Twenty miles or more from the coast.—The North-east monsoon sets in earliest in that part of the region which lies east-north-eastward of Hainan. It is well established there in September, i.e. when mean pressure is becoming high over central Asia, and nearly half of all winds there in that month are from north-east, east-north-east or east. By October it has normally extended down to about latitude 10° N., but it is not until November or December that it reaches the equator. Between the equator and about latitude 5° N. the direction of the wind in this monsoon is more northerly than north-easterly. It continues until April or May in the north and until March or April in the south.

Over most of the South China sea this monsoon blows in successive pulsations, periods of strong wind alternating with periods when it is moderate. In the north it sometimes begins with a period of strong winds or gales lasting for several days and a rapid rise of pressure over the northern and central parts of China. Its main characteristics in different sections of the region covered by this volume are as follows :—

East-north-eastward of Hainan.—The monsoon is steadiest from December to February, when 80 to 90 per cent. of all winds are from between north and east. In the extreme east of this section the wind reaches Beaufort force 7 or more on six to seven days per month from October to January and on three to four days per month from February to April, but near Hainan winds of this strength are much less common. In March and April winds from between south and east become increasingly frequent, and by May, which, in this section, is the transitional month between the North-east and South-west monsoons, winds from between south-east and south-west are as common as those from between north and east.

Westward of Hainan, and in the Tongking gulf.—The monsoon is rather less steady; nevertheless from October to February about three-quarters of all winds are from between north and east. There are winds of force 7 or more on four to five days per month in November and December, on two to four days per month from January to March, and less than once a month in April. Even as early as March, in this section, there are more winds from between south and east than from between north and east, and in April south-easterly winds are predominant.

Off the east coast of South Viet-Nam, between about latitudes 10° N. and 15° N.—Winds from between north and east are the most frequent from October to March, and from November to January 80 to 90 per cent. of all winds are from this quadrant. Winds of force 7 or more occur on four to five days per month from November to January but only on two to three days per month in October and March, and less than once a month in April. In this section, although winds from between south-east and south become increasingly common in March and April they do not outnumber the winds from between north and east, until May, in which month winds from between north and east become very uncommon.

Southward of the south-east coast of South Viet-Nam to about latitude 5° N.—North-easterly winds are only beginning to displace the south-westerlies in October, but from December to February about 90 per cent. of all winds are from between north and east. Winds of force 7 or more occur on three to four days per month from November to

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Fig. 1. MEAN PRESSURE AND PREDOMINANT WINDS—JANUARY

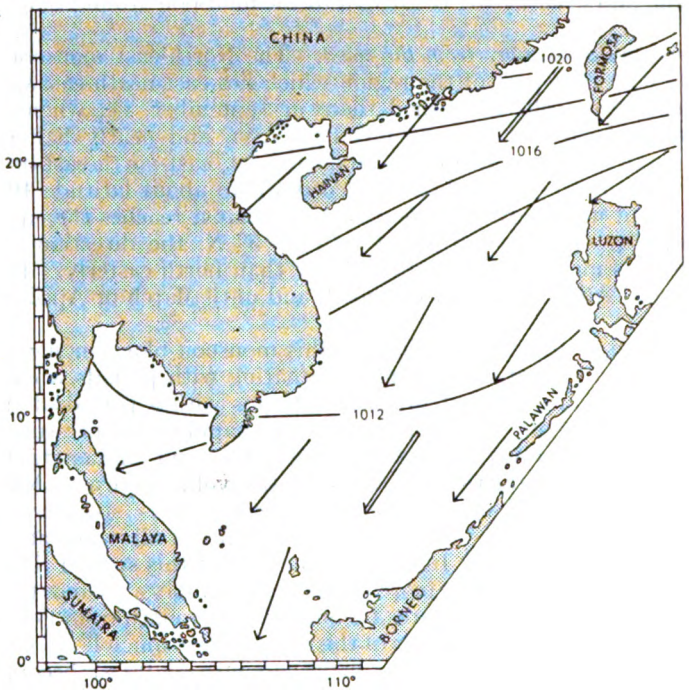

Fig. 2. MEAN PRESSURE AND PREDOMINANT WINDS—JULY

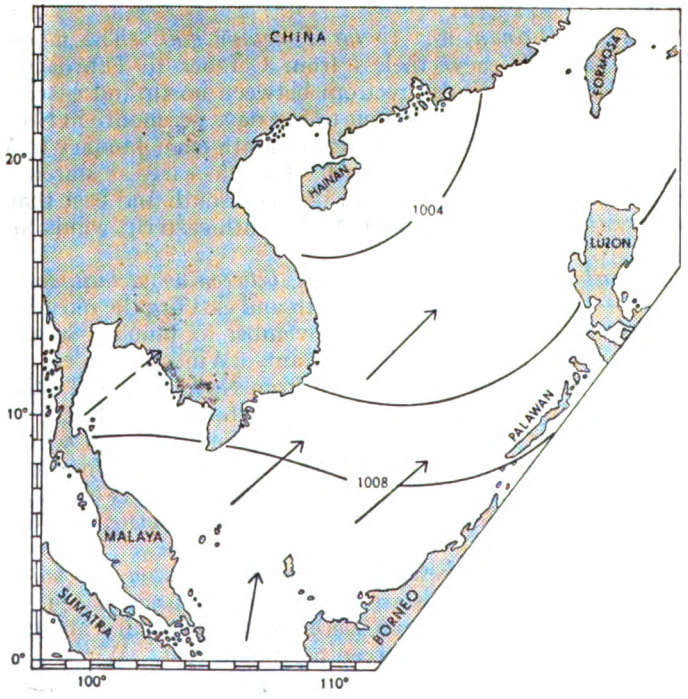

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Fig. 3. PERCENTAGE FREQUENCY OF GALES (BEAUFORT FORCE 7 OR OVER)—DECEMBER

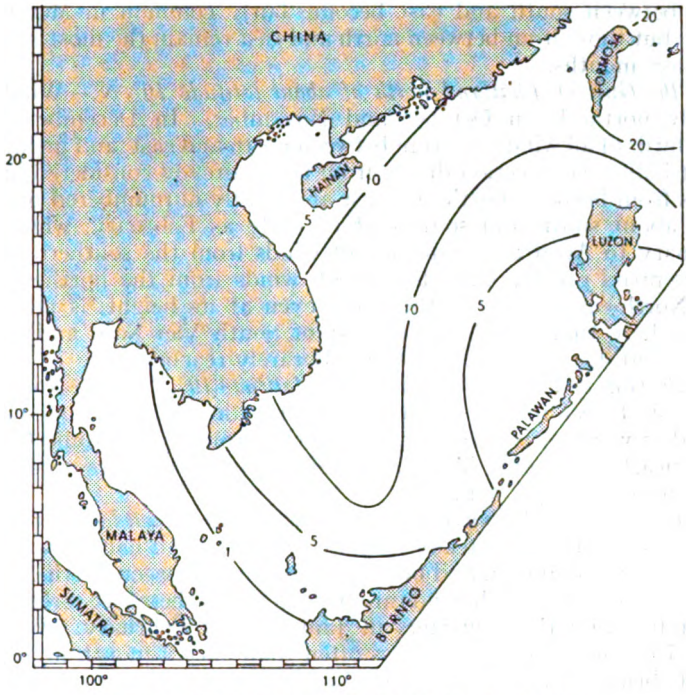

Fig. 4. PERCENTAGE FREQUENCY OF GALES (BEAUFORT FORCE 7 OR OVER)—MAY

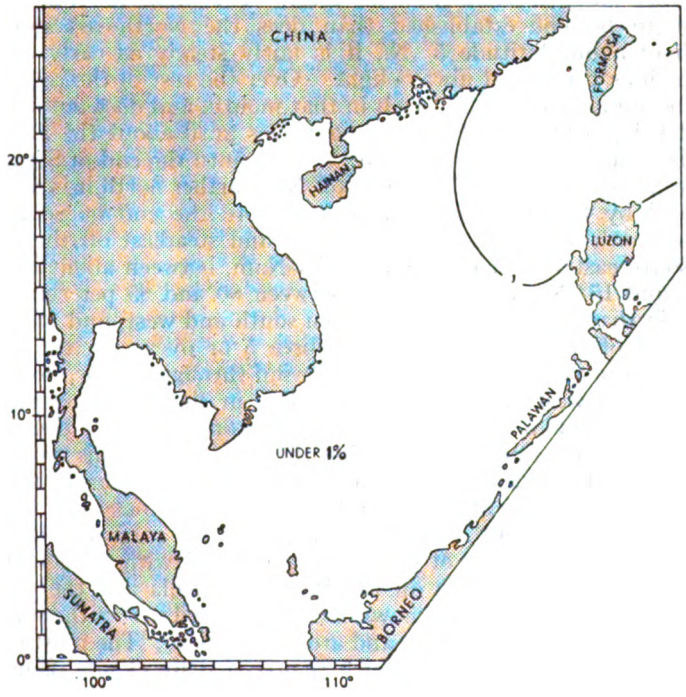

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Chart 1263.

January, and about once a month in October and February. Winds from between south and east become fairly common in March and April, but those from between north and east remain the most frequent in those months.

In the Gulf of Thailand north of about latitude 10° N.—Winds are mainly northerly in October and November. In December about two-thirds of all winds are from between north and east, and in January about half. This section differs from those already considered in that winds from between north and east are greatly outnumbered by those from about south and south-east as early as February, while from February to April the frequency of winds from the southern half of the compass greatly exceeds that of winds from the northern half. The North-east monsoon, therefore, even at its height, is much less steady here than off the east coast of South Viet-Nam and farther north, and does not last for long. It rarely reaches force 7.

In the Gulf of Thailand south of about latitude 10° N.—The North-east monsoon blows mainly from an easterly direction throughout the period in which it is predominant, which is roughly from mid-October until nearly the end of March. Winds of force 7 or more occur on an average about once a month.

North-eastward of Singapore strait, southward of about latitude 5° N.—The monsoon is fairly steady from about the second half of November until the end of March, and blows mainly from between north-east and north; two-thirds of all winds are from between these two directions in December, and three-quarters in January and February. Winds of force 7 or more occur rather less often than once a month in January and February, and very seldom during the rest of the monsoon.

South-west monsoon.—Predominant winds in this monsoon are shown in Figure 2.

Twenty miles or more from the coast.—This monsoon takes much longer to become established than does the North-east monsoon. South of about latitude 5° N., it is fairly steady as early as May, although as yet almost always light. Over the rest of the region it is only beginning to establish itself in that month, and does not attain to full development until June. It continues until about the middle of October south of about latitude 5° N., and until the end of September between about latitudes 5° N. and 15° N.; farther north it is normally replaced by the North-east monsoon before the end of September. The South-west monsoon is strongest and steadiest off the eastern and south-eastern coasts of South Viet-Nam, between about latitudes 5° N. and 15° N., and in August between 80 and 85 per cent. of all winds in that region are from between south and west, and more than one-third of these are of Beaufort force 5 or over. In the Gulf of Thailand the average direction of the wind throughout the monsoon is more nearly west than south-west, while in the Tongking gulf and south of latitude 5° N. is mainly between south-east and south-west.

Although over much of the region the wind during this monsoon is mainly light to moderate, it reaches force 7 or more on one or two days per month north of about latitude 5° N., sometimes as a result of a typhoon (*see* p. 49). Such winds are very rare farther south, except in squalls, many of which are associated with thunderstorms. Squalls are fairly common off the Malay peninsula and the southern part of Thailand, and are known locally as "Ribut"; they are also common in the Tongking gulf and around Hainan. The most dangerous type is the arch squall, which is preceded by clouds rising from

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Chart 1263.

the horizon in the form of an arch ; heavy rain is usual with the squall when the arch is passing overhead. Figure 4 shows the percentage frequency of winds of force 7 or more in May, the month during which in general gales are least frequent.

Coastal winds.—Near the coast the monsoons are much modified by the land, especially where it is mountainous, as is the case over most of the Malay peninsula and South Viet-Nam (*see* standard article on " Local modification of the weather near the coast," page li). Land and sea breezes, for instance, are much in evidence when the monsoons are weak, especially in the South-west monsoon. On coasts where one or other of the monsoons is an offshore wind, the land and sea breezes may be almost the only winds during that monsoon, except when the latter is unusually strong, in which case the land and sea breezes may deviate, reinforce or weaken the monsoon wind. Land and sea breezes are generally prominent also during the transitional periods between the two monsoons.

According to the Malayan Meteorological Service, at Kuala Trengganu (*Lat. 5° 20′ N., Long. 103° 08′ E.*), there is a maximum of wind speed from 1400 to 1500, local time, when the sea-breeze is at its height, and a much smaller maximum at about 0600, when the land breeze is strongest. There is a minimum at about 0900, when the land breeze has died away, and another at 2100 when the sea breeze has subsided. The average speed of the wind at the morning maximum is about 4 knots, and at the afternoon maximum from 6 to 7 knots.

On the south-eastern coast of South Viet-Nam the sea breeze combines with the monsoons during the day ; near the shore a light land breeze is sometimes felt at night ; land and sea breezes are of regular occurrence during April.

Along the coast of Central Viet-Nam, land and sea breezes are fairly regular during the South-west monsoon. The wind dies away at about 2000, local time, and the land breeze soon begins, and continues until 0700 or 0800 ; at about noon the sea-breeze springs up from an easterly direction, and veers during the day.

Squalls, including the arch squalls described in the previous section, are rather more frequent on the coast than at sea, and may occur in any season. They are to be expected in and off river estuaries with strong offshore winds, and where the hinterland is mountainous. They have been reported to be violent at times at the heads of the gulfs of Thailand and Tongking and near the mouth of the Chu chiang.

Typhoons may occur in any month. They are most frequent from June to November and rarely occur between January and April (*see* p. 49).

The region as a whole is rather cloudy, but in most parts there is a season with comparatively little cloud.

Cloud.—*North of about latitude 20° N.*—At sea, the average amount of cloud is nearly seven-tenths from November to April, and less than six-tenths from July to October. On the coast the cloudiest months are February to April (between eight- and nine-tenths), and the least cloudy October to December (little more than five-tenths).

Between about latitudes 10° N. and 20° N.—The amount of cloud at sea decreases somewhat southward. It is greatest (average amount six-tenths or slightly over) from October to February and least (four- to five-tenths) from March to May. On the coast there is generally more cloud than at sea and no well-defined season of little cloud.

In the Gulf of Thailand.—The cloudiest months at sea are June to

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September (average amount a little over seven-tenths) and the least cloudy January to April (between four- and five-tenths). Near the coast the seasonal variation differs from place to place, and depends partly upon the degree of exposure to the two monsoons. At Bangkok the mean amount of cloud is only two- to three-tenths from November to March, whereas at Kuala Trengganu November and December are among the cloudiest months (average amount between seven- and eight-tenths), the least cloudy period there being February to April, with barely five-tenths.

South of about latitude 5° N.—The average amount of cloud at sea is least in March and April (four- to five-tenths) and greatest from September to January (more than six-tenths). It is probable that on the coast the cloudiest season is also from September to January, but the amount of seasonal variation is generally less than at sea.

Rainfall.—The rainfall is generally abundant, the annual average ranging from about 50 to 130 inches (from two to more than five times that of south-east England). It is about 100 inches among the islands northward and north-eastward of Singapore, but varies greatly in the gulfs of Thailand and Tongking, and on the coasts of Central Viet-Nam, partly as a result of varying degrees of exposure to the two monsoons.

Among the wetter places, with an annual average between 100 and 130 inches are Kuala Trengganu, on the western side of the entrance to the Gulf of Thailand, Duong Dong on the eastern side of that gulf, Kwang-Tri, on the western side of the entrance to the Gulf of Tongking, and Mon-Cay, at the head of that gulf.

At Cap St. Jacques, on the south-east coast of South Viet-Nam, the annual average is only a little over 50 inches, and at Bangkok, at the head of the Gulf of Thailand, only about 55 inches.

On the coast, northward and north-eastward of Hainan, the yearly average is generally between 50 and 70 inches, but exceeds 80 inches at Hong Kong.

The average number of days per month with appreciable rain (0·04 inches or more) in the wettest months at the wettest places is about 20, and the number with considerable rain (0·40 inches or more) about 15. At such places the monthly fall may be 20 to 30 inches in the wettest months. Near the head of the Tongking gulf, however, from January to April, months in which the fine rain or wet fog known as "crachin" often occurs, there are many days of appreciable rain on which the measured amount is small, an unusual feature in the Tropics; in some places there are as many as 8 to 12 days per month with appreciable rain in months with an average fall of less than two inches.

North of about latitude 20° N. the South-west monsoon is nearly everywhere the wettest season, but farther south most of the year's rainfall generally comes during the transitional period after the South-west monsoon and during the early part of the North-east monsoon. At Kwang-Tri, on the east coast of Central Viet-Nam (*Lat. 16° 44′ N.*), nearly three-quarters of the year's fall is received between September and December, the monthly average being about 23 inches both in October and November; in the Anambas eilandem (*Lat. 2° N. to 3° N.*) the wettest season is from October to January.

There is generally a relatively dry season, and the average rainfall in some of the driest months is very small locally; at Cap St. Jacques, from January to March it is only a small fraction of an inch, and at Bangkok in December and January only about a quarter of an inch.

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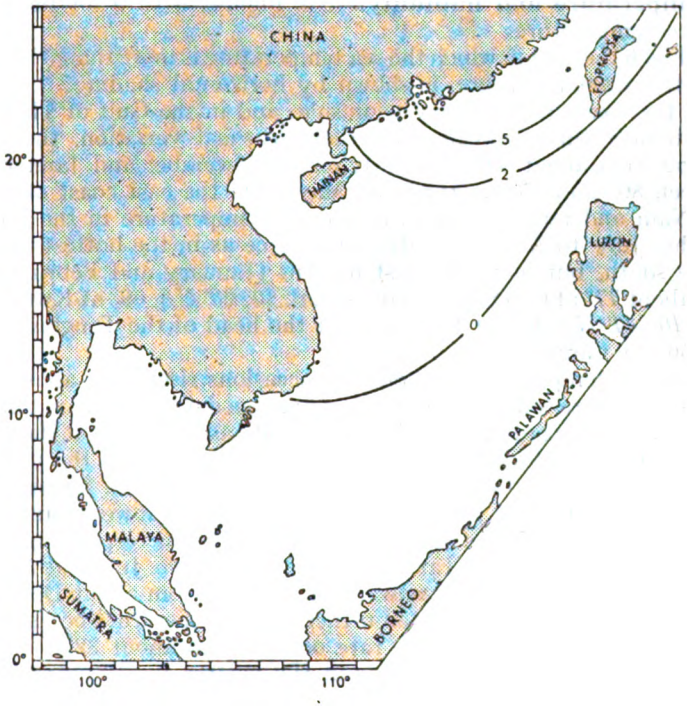
Southward of about latitude 6° N., however, there is virtually no dry season.

Except east-north-eastward of Hainan, much of the rain falls in thunderstorms. Most of these develop over the land during the afternoon, and many drift out to sea, where they are encountered more often at night than during the day. North of about latitude 16° N. the monthly frequency is nearly everywhere greatest during the South-west monsoon, but farther south it is at least as great from March to May, and even greater near the equator.

East-north-eastward of Hainan thunderstorms are common in July and August.

Fig. 5. PERCENTAGE FREQUENCY OF FOG—APRIL



Over the region as a whole the average number of thunderstorms in a year is very large, in many places 100 or more.

Fog and visibility.—*See* Figure 5. *At sea.*—Fog is very rare eastward of the Malay peninsula and in the Gulf of Thailand. South-eastward and eastward of South Viet-Nam it occurs on about one day in two months from January to April, and in Tongking gulf on one day per month in January and April and on two to three days per month in February and March. These fogs in Tongking gulf are frequently the result of the very fine drizzle known locally as "crachin." Between Hainan and about 112° E. there is fog on about two to three days per month from January to April, but very seldom in other months; farther east the frequency is greater, reaching three to four days per month from January to April, and one to three days per month from May to July.

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On the coast.—Information for the coast is scanty. It suggests that fog does not in general occur more often than once or twice a month south of about latitude 15° N., but that farther north, it is fairly common from January to April, although not much more so than at sea.

At sea, south of about latitude 15° N., visibility is less than five miles on five to six days per month, except in June (and south of about latitude 4° N. in July also) when the number falls to about two to four days. In Tongking gulf the frequency of such days increases rapidly northward; near the head of that gulf and farther east, from January to April, the number of days per month is sixteen to twenty-five; in May and June the number is considerably less, and from July to December is only five to six. Rain or " crachin " is often the cause of this poor visibility in the north.

Temperature and humidity.—*See* Figures 6 to 9 for mean sea surface temperature.

In Fig. 6 the area in which the sea temperature is more than 3° greater than the air temperature, is shown by horizontal shading.

Off the coast of the Malay peninsula, and in the Gulf of Thailand, high temperatures prevail, with little seasonal variation, the mean ranging from about 80° or slightly less in December and January, to between 80° and 85° in April and May. On the east coast of South Viet-Nam and farther north the average temperature in the hottest months (June to August) is about the same as in the hottest months in the south, but in the coldest months (January and February), is only about 77° at Cap Saint Jacques (*Lat. 10° 20′ N.*), 69° at Kwang-Tri (*Lat. 16° 44′ N.*), 62° at Phu Lien (at the head of the Tongking gulf) and 56° at Canton.

Although temperature has on rare occasions risen well above 100° locally, there are few places where the average daily maximum temperature, even in the hottest month, is above 90°, as is the case at Bangkok. On the other hand, during at least five or six months in the year the nights are uncomfortably warm; at Kuala Trengganu, for example, the average minimum temperature at night is not lower than 71° in any month, and is 74° in May; at Phu Lien the corresponding figure is 78° in June and July, and at Hong Kong 78° in June, July and August.

On the coast east-north-eastward of Hainan, from about December to January, the nights are often rather cold, temperature occasionally falling below 40°, and on very rare occasions to about 32°. On the upper reaches of the Pei chiang and Hsi chiang, frost and snow are common in these months.

Relative humidity is rather high throughout the year over most of the region, averaging between 80 and 90 per cent. on the coast, but at Bangkok the air is decidedly less damp (average about 70 per cent.). East-north-eastward of Hainan humidity falls to between 70 and 75 per cent. from October to December.

The mean temperature of the sea surface does not in this region in any month differ more than about a degree from that of the overlying air. Off the coast of the Malay peninsula and in the Gulf of Thailand mean sea temperature ranges only from about 80° or 81° in January and February to 84° or 85° from April to June. Off the coast of South Viet-Nam, and farther north, there is a general increase in the range with increasing latitude; in about latitude 10° N. it is from about 77° in February to 84° in May; at the head of the Tongking gulf from about 64° in February to 84° or 85° in July and August, and off Hong Kong from about 60° in February to 82° in August. In general,

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Fig. 6. MEAN SEA SURFACE TEMPERATURE—FEBRUARY

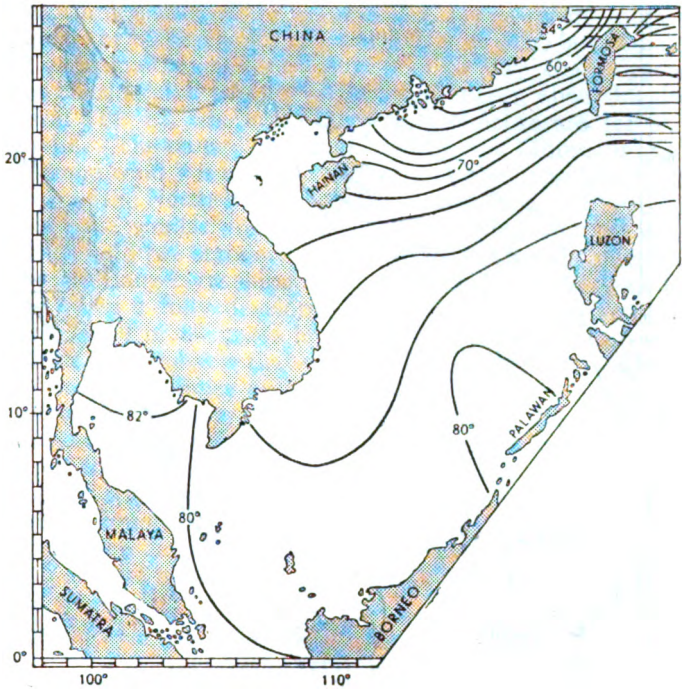

Fig. 7. MEAN SEA SURFACE TEMPERATURE—MAY

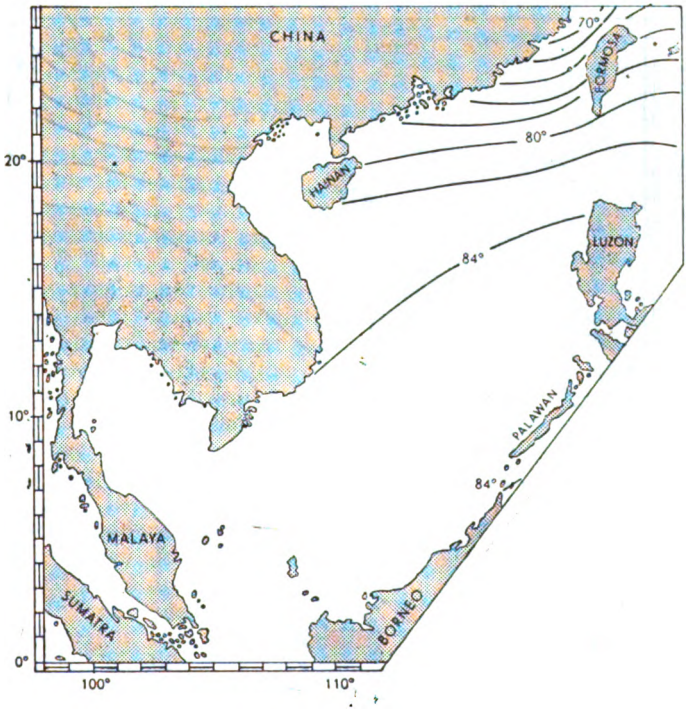

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Fig. 8. MEAN SEA SURFACE TEMPERATURE—AUGUST

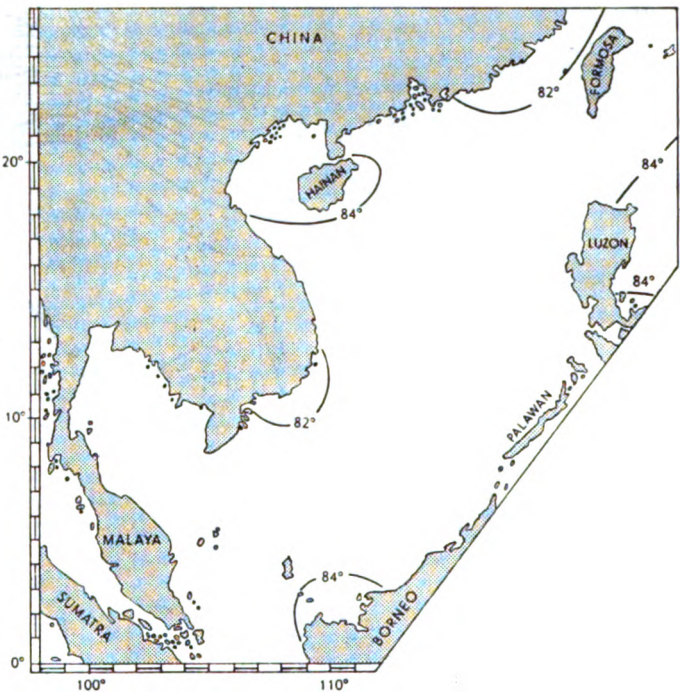

Fig. 9. MEAN SEA SURFACE TEMPERATURE—NOVEMBER

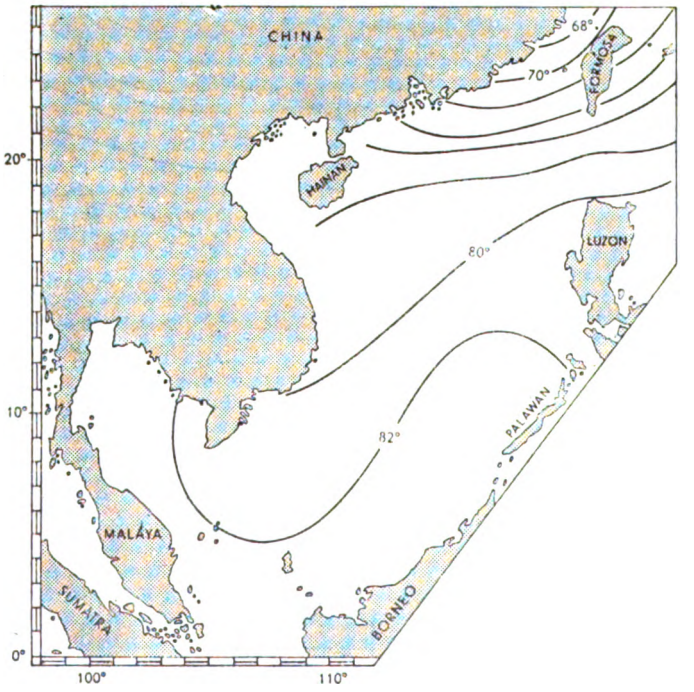

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Chart 1263.

sea temperature measured on a particular day is rarely more than 2° or 3° above or below the mean for the time of year, but east-north-eastward of Hainan, from about November to May, the difference is sometimes considerably greater, especially between about longitudes 112° E. and 114° E., where in March it is sometimes 8° or 9°.

Typhoons.—The name " typhoon," which is of Chinese origin and means " strong wind," is given to the tropical revolving storms of the western part of the North Pacific ocean, and the China and Yellow seas.

Typhoons are similar to the tropical revolving storms of other parts of the world (*see* standard article, p. xl) and are the outstanding meteorological danger to shipping in these waters. At sea, during the period when a fully developed typhoon is most active, a mean wind speed of 70 or 80 knots is frequent, but during exceptionally severe storms it is probable that over the open sea speeds approaching 150 knots may sometimes occur.

It is impossible to give accurate statistics about the frequency of typhoons at sea, since ships try to avoid them, but some idea can be obtained of their relative frequency in different months. In the meteorological atlas, published in 1931 by the *Service Meteorologique de l'Indochine Française*, the total number of typhoons in the China sea shown in each month from 1911 to 1929 is as follows (the number in brackets are the numbers of typhoons that appeared to form over the China sea itself) :—

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
3	0	0	0	6 (3)	11 (6)	31 (9)	24 (8)	20 (9)	22 (8)	22 (5)	7	146

Combining these figures with monthly figures obtained for the China sea westward of longitude 120° E. and southward of latitude 25° N. from the atlas of the tracks of 620 typhoons, 1893–1918, published by the Zi-ka-wei Observatory, the mean monthly frequencies for the 45 years are as follows :—

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
	Less than	Less than										
0·2	0·1	0·1	0·1	0·4	0·7	1·7	1·2	1·6	1·5	1·0	0·4	8·9

These statistics show that July to October is the period of greatest frequency for the China sea, as a whole, and that on an average nine typhoons occur each year within that period, which includes most of the South-west monsoon, and part of the transitional period which follows it.

It is, however, important to bear in mind that, owing to the limited area over which the full strength of a typhoon extends, there is a very great difference between the frequency with which a typhoon crosses some part of the region covered by this volume, and the frequency with which a particular place experiences the destructive winds of a typhoon. There is no point within this region where long periods of years may not go by without such winds being experienced.

Tracks of typhoons.—In Figures 10 to 13 the tracks of typhoons for the period 1911 to 1929, as shown in the atlas for French Indo-China, are reproduced for the months of June, August, October and December. They show that the zone of greatest typhoon frequency moves northward during the summer and retreats southward after August. In consequence, the season of greatest frequency for a particular region varies greatly with latitude. For example, the head of Tongking gulf and the coast east-north-eastward of Hainan experience many storms between June and August, although the

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Fig. 10 (JUNE)

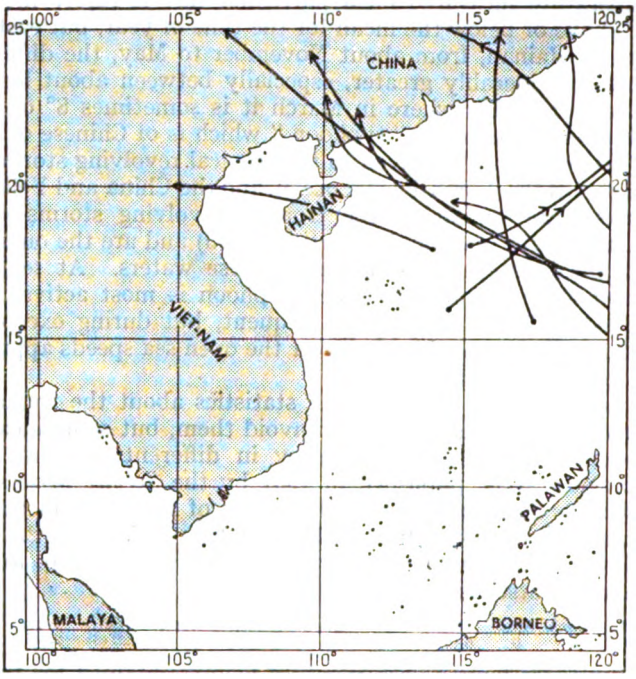

Fig. 11 (AUGUST)

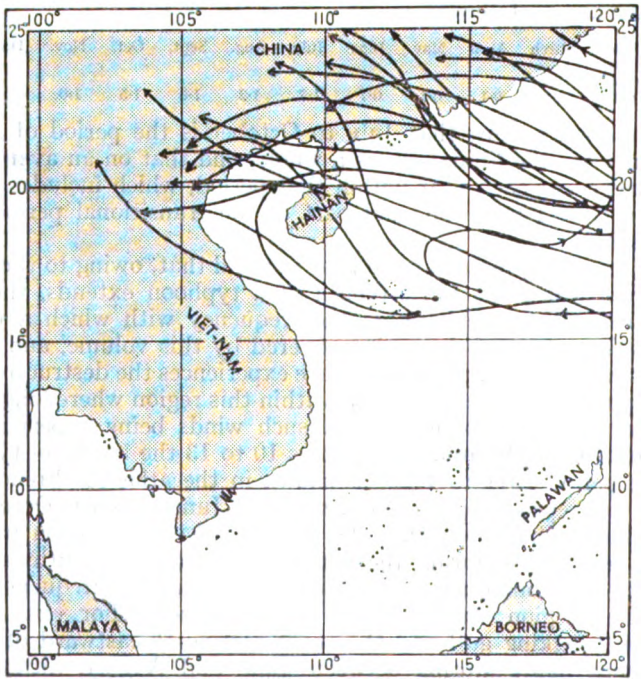

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Fig. 12 (OCTOBER)

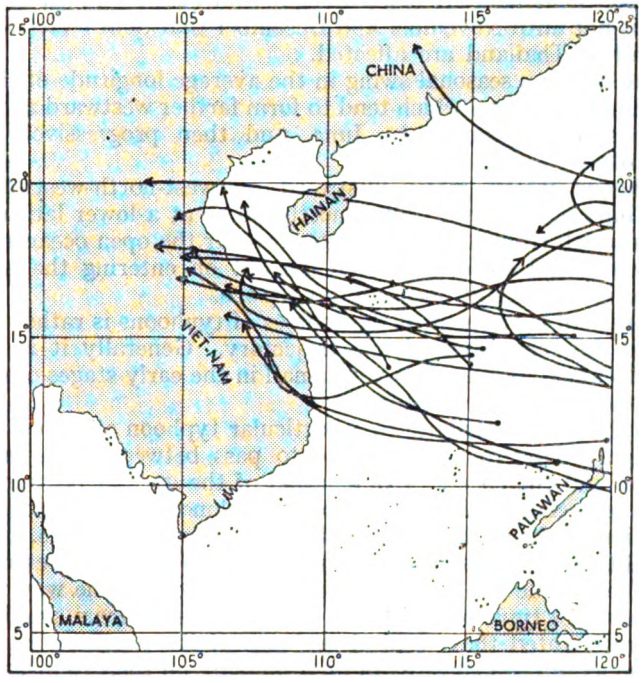

Fig. 13 (DECEMBER)

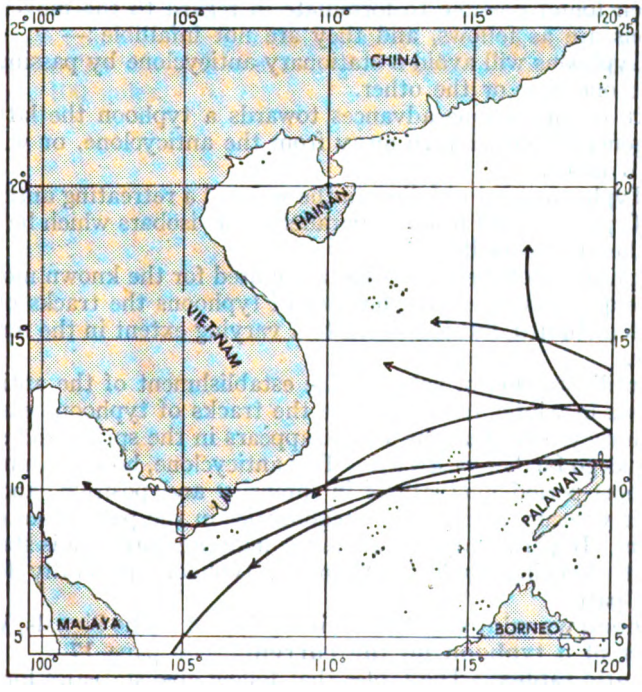

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Chart 1263.

season for them has virtually not begun south of about latitude 15° N., and it is not until November and December that South Viet-Nam and the Gulf of Thailand are affected.

There is also a seasonal swing in the average longitude of the point of origin of typhoons, which tend to form farther westward as the year advances from January to June, and then progressively farther eastward.

Typhoons which move westward or west-north-westward into Indo-China or southern China mostly do so at a lower latitude than that in which tropical revolving storms over the open ocean normally "recurve," and since they soon die out on entering the mainland recurvature generally does not take place.

The rate of movement of the centres of typhoons is rather variable even in different parts of one trajectory. Generally it is between 5 and 15 knots, but is often very small in the early stages of development and during recurvature.

It is unwise to attribute to a particular typhoon any special track, and highly dangerous to attempt to pass between an approaching typhoon and the coast. Examination of the general pressure distribution, especially with regard to anticyclones, will help to give an indication of the probable path which the storm will take. There is no doubt that the positions and movements of the high-pressure areas which lie outside the storm field are connected in some way with the movements of typhoons, but this connection is far from simple. It is sometimes stated that tropical cyclones of the northern hemisphere move so as to keep the area of high pressure on their right-hand side. This is by no means always true of typhoons, since these storms often recurve on the south-eastern side of an anticyclone, thereby placing the high pressure area on their left-hand side. The only rules that it has been found possible to formulate in regard to the movement of typhoons are as follows, and they are not infallible :—

(1) Typhoons will avoid a stationary anticyclone by passing round it one way or the other.

(2) If an anticyclone advances towards a typhoon the latter will generally either turn away from the anticyclone, or will cease to move.

(3) Typhoons tend to follow in the wake of a retreating anticyclone.

(4) Typhoons tend to move parallel to the isobars which lie outside the storm itself.

The application of these rules has accounted for the known movement of three-quarters of a large number of typhoons the tracks of which have been studied, but has failed to a varying extent in the remaining quarter.

As an illustration of rule (1), the establishment of the anticyclone over Asia in winter tends to force the tracks of typhoons eastward; as the anticyclone weakens and disappears in the spring and summer the tracks go farther westward. This anticyclone, however, undergoes large short-period fluctuations in intensity and position, and these, when they occur, often cause irregularities in the path of an existing typhoon. In periods during which the high pressure area is stationary and not changing much in intensity, typhoons generally follow a regular path.

Typhoon warnings.—*See* Admiralty List of Radio Signals, Vol. III.

Effect of a typhoon on the current.—*See* page 17.

Climatic tables.—The tables that follow give statistics for several

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Chart 1263.

land stations at which there is a regularly reporting weather station. The figures given are averages, percentage frequencies, or extremes, as stated; it must be realized that these values refer to the actual positions in which the weather has been observed and *not* necessarily to the open sea or to the approaches to ports in the vicinity. The table for land stations should therefore be consulted with discretion, since many meteorological elements are affected, sometimes a great deal, by local conditions. The following notes indicate ways in which conditions in the open sea may be different from those at the nearest reporting station for which a table is published.

(1) Temperatures over the sea are less extreme, or show smaller departures from the mean, than those over the land. In winter the air temperature over the sea is usually higher than at a land station, especially during the night and early part of the day. In summer the air temperature over the sea is usually lower than that at a land station, especially during the afternoon.

(2) Since much of the rain at coastal stations in this region is orographic, the figures given are not representative of rainfall at sea in the vicinity. In general there is less rain at sea than on the coast.

(3) Cloud amount, which in this region is very variable, is only broadly representative of the state of the sky at sea. There is a tendency for the amount to be less at sea than on the coast during the day, but to be slightly greater at night.

(4) Wind speed is nearly always greater over the sea than over the land, and there may be twice the number of gales at sea than are experienced at a shore station unless it is exceptionally well-exposed on, for example, a headland or small low-lying island. Wind direction is affected as explained under "Local modification of the weather near the coast," on page li.

(5) The figures for fog at coastal stations are no guide to fog frequency at sea and in the approaches to ports south of about latitude 15° N., but farther north they are roughly applicable to the open sea within, say, 100 miles.

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PLACE—KUALA TRENGGANU. LAT. 5° 20′ N., LONG. 103° 08′ E. Height above Mean Sea Level, 105 feet.
Climatic Table compiled from 4 to 12 Years' Observations, 1930 to 1941.

MONTH	PRESSURE at M.S.L. Mean	AIR TEMPERATURE Mean of Daily max.	Daily min.	Highest in each month	Lowest in each month	Relative humidity 0700	1300	SKY No. of days Clear less than 2/10	Cloudy more than 8/10	RAIN Average fall	No. of days with 0·04 in. or more	WIND DIRECTION ½(9 + 15 + 21) Percentage of observations from N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	Mean wind force or speed a.m.	p.m.	No. of days with wind force 8 or more	No. of days with visibility less than ½ mile
	mb.	°F.	°F.	°F.	°F.	%	%			in.														
January	1011	83	72	86	67	94	76	0·6	15	12·5	17	9	45	19	1	1	10	5	3	7	—	—	0·3	4
February	1011	85	71	87	67	97	71	2	6	3·8	7	5	35	21	2	2	18	5	1	11	—	—	0	3
March	1010	87	73	90	69	97	70	2	6	6·3	10	4	33	20	2	3	17	5	1	15	—	—	0	4
April	1009	89	73	92	71	97	69	0·7	7	5·4	10	3	18	15	4	6	24	7	1	22	—	—	0	2
May	1008	90	74	93	71	96	68	0·4	9	4·7	9	4	9	13	6	10	29	8	4	17	—	—	0	1
June	1008	89	73	92	70	96	68	0·8	11	4·9	9	2	9	14	7	11	32	9	3	13	—	—	0	0·7
July	1008	89	73	92	70	97	70	0·3	12	6·1	11	1	5	16	13	15	31	6	3	19	—	—	0	2
August	1008	89	73	91	70	97	69	0·4	11	6·6	10	1	5	15	13	15	34	7	2	8	—	—	0	2
September	1009	88	73	91	70	97	69	0·3	14	6·5	12	3	9	14	6	10	37	8	3	10	—	—	0	0·5
October	1009	87	73	90	71	97	73	0·3	17	13·1	19	8	11	9	3	6	34	12	6	11	—	—	0	1
November	1009	85	73	89	71	97	78	0	17	24·8	19	10	14	11	2	4	28	11	8	12	—	—	0	1
December	1010	83	72	86	69	95	79	0·2	18	24·1	20	13	29	14	1	1	17	9	8	8	—	—	0	1
Means	1009	87	73	93*	66**	96	72	—	—	—	—	5	18	15	5	7	26	8	4	12	—	—	—	—
Totals	—	—	—	—	—	—	—	8	143	118·8	153	—	—	—	—	—	—	—	—	—	—	—	—	—
Extreme values	—	—	—	95†	63††	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0·3	22
No. of years' observations	7	12										8									—	—	4	12

Standard of time: 110° E. meridian.

* Mean of highest each year.
** Mean of lowest each year.

† Highest recorded temperature.
†† Lowest recorded temperature.

Authorities:—Summary of Observations, Malayan Met. Service, Singapore.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

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PLACE—BANGKOK. LAT. 13° 45′ N., LONG. 100° 28′ E. Height above Mean Sea Level, 7 feet (29 feet after March 1937).
Climatic Table compiled from 5 to 44 Years' Observations, 1845 to 1950.

MONTH	PRESSURE at M.S.L.	AIR TEMPERATURE Mean of				Relative humidity		SKY No. of days		RAIN		WIND DIRECTION																Mean wind force		No. of days with wind force 8 or more	No. of days with visibility less than ½ mile
												0700									1300										
												Percentage of observations from									Percentage of observations from										
	Mean	Daily max.	Daily min.	Highest in each month	Lowest in each month	0700	1300	Clear less than 2/10	Cloudy more than 8/10	Average fall	No. of days with 0·04 in. or more	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	0700	1300		
	mb.	°F.	°F.	°F.	°F.	%	%			in.																						
January	1013	89	68	96	59	91	51	8	3	0·3	0·9	9	6	12	8	1	1	1	5	57	11	11	17	13	8	7	9	5	19	0·5	1·5	0	1
February	1012	91	72	98	65	93	56	6	3	0·8	1	2	6	15	12	1	0	1	1	62	2	4	8	7	38	21	6	2	12	0·4	2·0	0	2
March	1010	93	75	100	68	92	53	5	3	1·4	3	0	2	16	24	6	0	0	0	52	3	1	4	8	36	31	8	1	8	0·5	2·2	0	0·4
April	1009	95	77	101	72	88	56	3	7	2·3	3	1	4	13	15	7	2	2	1	55	3	3	3	10	30	23	8	2	18	0·6	1·8	0	0
May	1007	93	77	100	73	91	63	0	15	7·8	9	0	1	9	13	3	2	2	1	69	3	2	0	8	23	24	9	6	25	0·4	1·7	0	0·2
June	1007	91	76	97	73	91	66	0	19	6·3	10	0	1	3	6	7	12	8	0	63	1	1	0	5	23	36	18	7	9	0·4	2·1	0·1	0
July	1006	90	76	96	72	91	64	0	21	6·3	13	0	0	1	2	7	19	6	2	63	1	1	0	1	10	55	25	5	2	0·5	2·2	0	0
August	1007	90	76	96	74	92	65	0	22	6·9	13	1	0	2	3	4	13	4	1	72	0	0	1	1	13	43	31	3	8	0·4	2·1	0·1	0·7
September	1008	89	76	95	72	94	67	0	19	12·0	15	1	2	2	4	2	9	5	4	71	8	3	3	4	9	21	25	10	17	0·4	1·6	0	0·7
October	1010	88	75	95	71	94	69	0·7	14	8·1	14	10	5	3	5	1	1	1	3	71	29	14	9	5	5	8	8	8	14	0·4	1·5	0	0·2
November	1011	87	72	94	66	91	65	0·7	7	2·6	5	17	11	9	1	1	0	0	1	60	37	17	11	1	3	2	3	9	17	0·6	1·6	0	1
December	1013	87	68	94	60	90	66	6	6	0·2	1	17	11	6	1	0	0	0	2	63	37	17	15	6	2	1	1	10	11	0·5	1·7	0	0·8
Means	1009	90	74	103*	57**	91	62	—	—	—	—	5	4	7	8	3	5	3	2	63	11	6	6	6	17	22	13	6	13	0·5	1·8	—	—
Totals	—	—	—	—	—	—	—	29	139	55·0	88	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0·2	7
Extreme values	—	—	—	106†	52††	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	11–12	37–39		16–19		5–6		5–6		44	20	5–6																		5–6		7–9	5–6

Standard of time: Local.

* Mean of highest each year.
** Mean of lowest each year.

† Highest recorded temperature.
†† Lowest recorded temperature.

Authorities:—Campbell Highet, H., *The Climate of Bangkok*, Bangkok, 1912.
Monthly met. Bull., Hydrographic Service, Bangkok.

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PLACE—CAP ST. JACQUES. LAT. 10° 20′ N., LONG. 107° 05′ E. Height above Mean Sea Level, 600 feet.
Climatic Table compiled from 2 to 32 Years' Observations, 1907 to 1940.

MONTH	PRESSURE at M.S.L.	AIR TEMPERATURE Mean of				Relative humidity		SKY No. of days		RAIN		WIND DIRECTION																Mean wind speed	No. of days with gale	No. of days with fog
												0600 or 0700									1400 or 1600										
												Percentage of observations from									Percentage of observations from										
	Mean	Daily max.	Daily min.	Highest in each month	Lowest in each month	Mean daily max.	Mean daily min.	Clear less than 2/10	Cloudy more than 8/10	Average fall	No. of days with 0·04 in. or more	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	Mean of day		
	mb.	°F	°F.	°F.	°F.	%	%			in.																			knots		
January	1012	82	71	87	67	91	64	0·1	10	0·1	0·3	7	54	28	2	0	0	1	5	3	3	29	46	4	11	5	0	1	1	12·2	0	0
February	1011	83	72	89	68	90	69	1	8	0·0	0	4	49	38	0	3	4	0	1	1	4	43	46	2	1	4	0	0	0	11·6	0	0
March	1011	85	74	92	71	88	65	0	7	0·1	0	2	41	41	7	6	1	0	0	2	0	29	47	15	8	1	0	0	0	12·6	0·7	0
April	1009	89	77	95	73	89	65	0	9	1·2	4	0	28	32	10	10	15	3	0	2	0	12	38	15	27	3	2	0	3	9·1	9	0
May	1008	89	76	95	71	93	73	0·3	14	7·8	17	3	13	7	2	5	38	18	8	6	0	2	15	8	30	29	13	3	0	8·2	0·2	3
June	1007	87	75	91	71	95	75	0	13	7·7	16	0	12	3	0	3	54	13	12	3	0	0	10	5	10	54	15	4	2	8·8	0·2	2
July	1007	85	74	87	70	96	79	0	21	8·8	15	0	0	2	2	6	61	13	16	0	2	0	0	2	16	65	13	2	0	12·2	1	1
August	1007	85	74	89	71	96	76	0	24	6·0	15	0	0	1	7	7	52	28	3	2	0	0	1	8	9	61	17	2	2	11·0	0·2	1
September	1008	85	74	89	71	96	77	0	25	7·5	19	1	2	4	1	4	49	20	15	4	0	0	3	1	10	53	16	13	4	10·6	0	2
October	1009	84	74	88	71	96	75	0	24	8·0	15	7	27	14	0	2	12	18	17	3	2	19	16	5	8	22	16	12	0	8·0	0·3	2
November	1010	83	73	88	69	95	72	0	19	2·8	5	9	40	22	0	0	1	12	14	2	7	32	19	2	8	15	4	8	5	8·1	0·2	0
December	1011	82	71	87	67	94	70	0	20	1·0	0·5	17	50	23	1	1	0	1	5	2	4	22	38	8	9	13	3	3	0	8·0	0·2	0
Means	1009	85	74	96*	66**	93	72	—	—	—	—	4	26	18	3	4	24	10	8	3	2	16	23	6	12	27	8	4	2	10·0	—	—
Totals	—	—	—	—	—	—	—	2	194	51·0	107	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	11
Extreme values	—	—	—	101†	59††	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	21	32		27		7		2–3		32	2–3	2–3																		6	6	6

Standard of time: 105° E. meridian.

* Mean of highest each year.
** Mean of lowest each year.

† Highest recorded temperature } in 32 years' observations, 1907–38.
†† Lowest recorded temperature }

Authorities:—MS. data supplied by Service Météorologique de l'Indochine, Phu Lien. (Annales du) Service Météorologique de l'Indochine, Phu Lien.

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PLACE—KWANG-TRI. LAT. 16° 44′ N., LONG. 107° 11′ E. Height above Mean Sea Level, 23 feet.

Climatic Table compiled from 2 to 32 Years' Observations, 1907 to 1939.

MONTH	PRESSURE at M.S.L.	AIR TEMPERATURE Mean of				Relative humidity		SKY No. of days		RAIN		WIND DIRECTION									Mean wind speed	No. of days with gale	No. of days with fog
												Mean of day											
												Percentage of observations from											
	Mean	Daily max.	Daily min.	Highest in each month	Lowest in each month	Mean daily max.	Mean daily min.	Clear less than 2/10	Cloudy more than 8/10	Average fall	No. of days with 0·04 in. or more	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	Mean of day		
	mb.	°F.	°F.	°F.	°F.	%	%			in.											knots		
January	1017	73	63	84	56	97	78	2	17	6·7	11	19	13	11	7	1	2	3	24	20	5·0	0	7
February	1016	75	64	90	57	97	77	3	9	2·2	4	16	10	12	7	2	2	5	25	21	4·2	0	6
March	1012	79	67	96	58	97	73	4	13	2·7	5	18	9	11	7	2	3	7	21	22	4·1	0	4
April	1009	87	72	99	65	97	64	3	11	2·2	6	11	11	12	10	2	5	9	12	28	3·8	0	4
May	1006	92	75	99	70	96	55	0·7	4	3·9	8	3	7	10	13	5	15	17	8	22	4·3	0	1
June	1004	93	77	98	73	94	55	2	6	3·0	5	2	2	4	6	4	26	39	6	11	5·6	0·2	0
July	1002	92	78	98	73	92	56	3	19	3·5	6	1	2	2	9	3	28	43	4	8	6·7	0	0
August	1004	93	77	98	73	92	55	1	13	3·8	9	1	2	2	5	3	29	43	4	11	6·5	0·3	0
September	1006	89	74	96	71	96	69	0·7	13	15·6	14	6	9	8	7	1	9	19	17	24	3·8	0	3
October	1012	83	72	92	67	97	72	2	15	22·1	15	13	17	12	12	2	2	11	17	14	5·0	0·3	6
November	1014	78	69	86	62	97	75	0	21	22·3	23	21	18	12	10	3	2	4	18	12	3·8	0·2	2
December	1016	74	65	83	57	97	77	1	21	12·0	17	15	19	14	12	1	2	3	20	14	5·6	0	2
Means	1010	84	71	101°	54°°	96	67	—	—	—	—	11	10	9	9	2	10	17	15	17	4·9	—	—
Totals	—	—	—	—	—	—	—	22	162	100·0	123	—	—	—	—	—	—	—	—	—	—	1	35
Extreme values	—	—	—	104†	49††	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	10–11	32		27		9		2–3		32	2–3	7–9									6	6	6

Standard of time: 105° E. meridian.

° Mean of highest each year.
°° Mean of lowest each year.

† Highest recorded temperature } in 32 years' observations, 1907–38.
†† Lowest recorded temperature }

Authorities:—MS. data supplied by Service Météorologique de L'Indochine, Phu Lien.
Annales du Service Météorologique de L'Indochine, Phu Lien.

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PLACE—PHU LIEN. LAT. 20° 48′ N., LONG. 106° 38′ E. Height above Mean Sea Level, 377 feet.
Climatic Table compiled from 2 to 32 Years' Observations, 1907 to 1939.

MONTH	PRESSURE at M.S.L. Mean	AIR TEMPERATURE Mean of Daily max.	Daily min.	Highest in each month	Lowest in each month	Relative humidity Mean daily max.	min.	SKY No. of days Clear less than 2/10	Cloudy more than 8/10	RAIN Average fall	No. of days with 0·04 in. or more	WIND DIRECTION 0600 Percentage of observations from N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	1400 Percentage of observations from N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	Mean wind speed Mean of day	No. of days with gale	No. of days with fog
	mb.	° F.	° F.	° F.	° F.	%	%			in.																				knots		
January	1019	68	57	81	48	94	65	2	22	1·2	8	5	33	33	13	3	0	0	7	6	8	9	20	22	19	5	6	6	5	6·9	0·1	6
February	1017	68	58	81	49	97	73	3	20	1·7	7	5	26	48	12	1	0	0	2	6	6	6	25	28	20	6	0	3	6	7·0	0·3	11
March	1014	71	62	84	53	98	76	0	25	1·8	8	8	23	32	22	9	1	0	2	3	6	10	20	28	16	2	3	3	12	7·3	0·6	13
April	1011	79	69	89	59	98	75	1	16	3·1	6	2	18	38	23	7	0	5	5	2	3	5	14	27	43	2	2	2	2	8·4	1	8
May	1007	87	75	96	69	97	68	0	15	7·9	10	9	13	12	16	33	2	2	7	6	4	2	8	27	51	2	3	3	0	9·1	2	2
June	1003	89	78	97	72	97	68	0·7	12	9·4	12	5	15	14	8	39	15	2	2	0	2	2	11	16	45	7	5	5	7	9·6	2	1
July	1003	89	78	97	72	97	69	0	18	11·7	15	5	7	9	8	20	15	12	8	16	5	2	7	13	30	13	15	8	7	9·2	3	1
August	1003	89	77	96	72	97	70	0·3	22	12·9	14	14	9	11	6	15	8	7	19	11	4	6	10	11	15	18	15	15	6	7·4	2	2
September	1008	87	75	94	69	97	66	2	13	12·0	18	15	27	27	2	6	1	1	9	12	6	17	15	20	15	3	6	8	10	7·5	2	2
October	1014	84	71	91	65	95	60	5	5	4·9	7	20	31	17	2	6	2	1	14	7	13	7	6	19	26	3	7	16	3	7·6	0·8	2
November	1017	78	65	87	55	93	57	3	9	2·2	2	18	49	22	0	3	0	0	6	2	16	19	12	20	16	3	5	7	2	7·2	0·2	2
December	1019	72	60	82	51	93	61	2	14	1·1	3	17	41	24	4	1	1	1	7	4	8	13	23	15	13	8	8	8	4	7·0	0·1	3
Means	1011	80	69	99*	47**	96	67	—	—	—	—	10	24	24	10	12	4	3	7	6	7	8	14	21	26	6	6	7	5	7·9	—	—
Totals	—	—	—	—	—	—	—	19	191	69·9	110	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	14	53
Extreme values	—	—	—	107†	43††	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	29	32		27		32		2–3		32	2–3	2–4																		29	27	27

Standard of time: 105° E. meridian.

* Mean of highest each year.
** Mean of lowest each year.

† Highest recorded temperature
†† Lowest recorded temperature
} in 32 years' observations, 1907–38.

Authorities:—MS. data supplied by Service Météorologique de l'Indochine, Phu Lien.
Annales du Service Météorologique de l'Indochine, Phu Lien.

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PLACE—HONG KONG. LAT. 22° 18′ N., LONG. 114° 10′ E. Height above Mean Sea Level, 109 feet.

Climatic Table compiled from 10 to 50 Years' Observations, 1884 to 1939.

MONTH	PRESSURE at M.S.L.	AIR TEMPERATURE Mean of				Relative humidity		SKY No. of days		RAIN		WIND DIRECTION 0600 Percentage of observations from									WIND DIRECTION 1300 Percentage of observations from									Mean wind speed		No. of days with wind force 8 or more	No. of days with visibility less than ½ mile
	Mean	Daily max.	Daily min.	Highest in each month	Lowest in each month	0700	1300	Clear less than 2/10	Cloudy more than 8/10	Average fall	No. of days with 0·04 in. or more	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	0700	1300		
	mb.	°F.	°F.	°F.	°F.	%	%			in.																			knots			
January	1020	64	56	74	45	77	66	3	15	1·3	4	23	24	35	5	0	1	2	2	8	12	18	47	14	1	3	8	2	0	6·3	7·6	0	4
February	1019	63	55	74	46	82	73	2	18	1·8	5	14	19	45	8	1	0	0	1	12	8	12	54	10	2	2	6	4	2	7·9	8·9	0	5
March	1016	67	60	79	51	84	74	2	21	2·9	7	11	16	50	7	1	1	1	3	10	7	12	53	9	6	2	7	4	0	8·3	9·7	0·1	9
April	1013	75	67	84	59	87	77	1	20	5·4	8	3	16	55	8	4	2	2	1	9	4	10	54	7	8	5	7	3	2	7·6	9·5	0·1	8
May	1009	82	74	89	68	87	78	0·8	18	11·5	13	1	14	43	7	7	7	3	3	15	1	7	49	9	9	12	11	2	0	6·9	9·7	0	2
June	1006	85	78	90	73	86	77	0·2	17	15·5	18	0	9	23	8	19	23	4	2	12	1	5	24	7	23	29	8	2	1	6·1	8·5	0·1	0·9
July	1005	87	78	91	74	87	77	0·4	13	15·0	17	2	5	24	12	14	13	9	3	18	2	8	26	13	15	18	13	2	8	5·9	8·8	0·7	1
August	1005	87	78	91	74	87	77	1	13	14·2	15	2	7	19	7	7	14	15	5	24	1	4	28	7	9	21	26	3	1	5·2	8·1	0·4	3
September	1008	85	77	91	72	83	72	2	10	10·1	12	7	26	27	4	2	4	7	4	19	5	16	40	8	3	8	14	3	3	5·9	9·2	0·4	2
October	1014	81	73	87	65	75	63	7	8	4·5	6	20	39	28	2	0	0	0	1	10	11	13	51	17	0	2	3	2	1	7·2	9·1	0·2	0·6
November	1017	74	65	82	56	73	60	6	9	1·7	2	24	34	25	2	1	0	1	1	12	16	14	41	16	2	3	5	2	1	6·4	7·9	0·1	0·9
December	1020	68	59	76	49	74	63	6	12	1·2	3	20	28	37	5	1	0	0	1	8	15	11	46	16	2	2	6	2	0	6·1	7·6	0	2
Means	1013	77	68	93*	48**	82	71	—	—	—	—	11	20	34	6	5	5	4	2	13	7	10	43	11	7	9	9	2	2	6·7	8·7	—	—
Totals	—	—	—	—	—	—	—	31	174	85·1	110	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	38
Extreme values	—	—	—	97†	32††	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	50	50		50		20	20	21		50	20	10																	24		20	50

Standard of time: 120° E. meridian.

* Mean of highest each year.
** Mean of lowest each year.

† Highest recorded temperature.
†† Lowest recorded temperature.

Authorities:—MS. data supplied by Royal Observatory, Hong Kong.
Met. Results, Royal Observatory, Hong Kong.

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PLACE—CANTON, CUSTOM STATION. LAT. 23° 06′ N., LONG. 113° 18′ E. Height above Mean Sea Level, 29 feet.
Climatic Table compiled from 2 to 30 Years' Observations, 1908 to 1938.

MONTH	PRESSURE at M.S.L. Mean	AIR TEMPERATURE Mean of Daily max.	Daily min.	Highest in each month	Lowest in each month	Relative humidity 0600	1400	SKY No. of days Clear less than 2/10	Cloudy more than 8/10	RAIN Average fall	No. of days with 0·04 in. or more	WIND DIRECTION Mean of 3-hourly obs. Percentage of observations from N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	Mean wind force 0600 and 1500	No. of days with wind force 8 or more	No. of days with fog
	mb.	°F.	°F.	°F.	°F.	%	%			in.													
January	1022	63	49	78	38	73	51	1	15	1·8	5	65	4	5	5	4	1	0	2	14	2·1	0	1
February	1019	63	52	80	42	81	63	2	20	2·7	8	53	6	7	10	8	1	0	2	13	1·6	0	1
March	1017	69	55	82	47	84	70	2	22	3·6	11	40	5	9	18	9	1	0	3	15	1·5	0	2
April	1013	77	66	89	57	89	68	0·2	21	5·9	12	19	5	15	30	18	2	0	1	10	1·4	0	1
May	1010	86	74	92	68	91	68	0	14	9·9	15	13	4	14	34	24	3	0	2	6	1·3	0	0
June	1007	88	76	93	71	91	63	0·2	18	10·6	17	5	5	14	29	30	6	1	2	8	1·3	0	0
July	1005	91	78	96	75	91	62	0·2	11	9·9	16	2	6	23	25	24	7	2	3	8	1·4	0	0
August	1006	91	78	97	74	90	63	2	9	9·6	13	6	6	20	21	20	12	3	4	8	1·4	0	0
September	1010	89	76	94	69	84	55	1	14	5·4	10	24	14	17	14	9	5	2	6	9	1·5	0	0
October	1016	83	67	90	60	76	50	3	10	2·3	4	54	9	7	5	5	2	1	3	14	1·9	0	0
November	1019	77	60	85	49	74	46	6	8	1·6	3	60	7	4	4	4	1	0	2	18	1·7	0	0·6
December	1021	69	54	81	41	74	51	7	13	1·4	5	55	7	5	6	3	0	0	3	21	1·7	0	1
Means	1014	79	65	97*	36**	83	59	—	—	—	—	33	6	12	17	13	3	1	3	12	1·6	—	—
Totals	—	—	—	—	—	—	—	25	175	64·7	119	—	—	—	—	—	—	—	—	—	—	0	7
Extreme values	—	—	—	101†	34††	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	6–8	14		7–9		2–3		5–6		30	10	6–7									6–8	6–8	7–9

Standard of time : 120° E. meridian.

* Mean of highest each year.
** Mean of lowest each year.

† Highest recorded temperature } in 19 years' observations, 1920–38.
†† Lowest recorded temperature }

Authorities :—Ann. met. Rep., Nanking.
Monthly met. Bull., Nanking.

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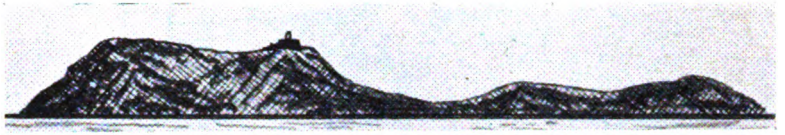
To face page 60.

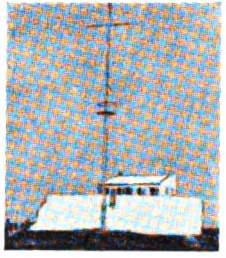
Tumpat lighthouse.
(*Original dated* 1948.)

Lighthouse, bearing 293°, 15 miles.



Pulau Obi.
(*Original dated* 1916.)

Lighthouse on southern shore of Hoihow bay.
(*Original dated* 1932.)



Fort A, Hoihow.
(*Original dated* 1932.)

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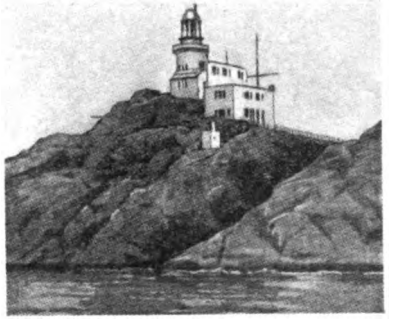
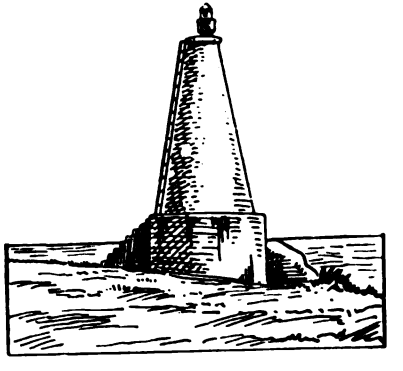
To face page 61.

Cape Kami lighthouse
Hainan strait.
(*Original dated* 1932.)



Wenwei chou (Gap rock) lighthouse,
Hong Kong approach.
(*Original dated* 1951.)

Fort Guia lighthouse from south-eastward.



Ko ho light-structure.

Lighthouses in the vicinity of Macao.
(*Originals dated* 1935.)

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CHAPTER II

EAST COAST OF THE MALAY PENINSULA FROM TANJONG PENAWAR TO TANJONG DUNGUN, WITH OFF-LYING ISLANDS AND DANGERS, INCLUDING ANAMBAS EILANDEN

Chart 3839.

MALAY PENINSULA.—East coast.—The east coast of the Malay peninsula southward of Tanjong Penawar (*Lat. 1° 31′ N., Long. 104° 17′ E.*), as far as Tanjong Datok, 8 miles southward, together with the Remunia shoals, which extend about 15 miles north-eastward from the latter point, is described in the Malacca Strait Pilot.

Foul ground, parts of which dry, extends about three-quarters of a mile eastward from Tanjong Penawar. Between this point and a point about 1½ miles northward foul ground extends about half a mile offshore, and a rock, 4 feet (1m2) high, lies about 1½ cables north-north-eastward of the latter point. A rock, which dries 3 feet (0m9), lies close northward of the 4-foot (1m2) rock, and a 3-fathom (5m5) patch lies 6½ cables north-eastward of it. Between the 4-foot (1m2) rock and Tanjong Lompot, 3 miles north-north-westward, the coast forms a bight, at the northern end of which foul ground extends about half a mile offshore. A rock, which dries 3 feet (0m9), lies about 1½ cables eastward of Tanjong Lompot.

Between Tanjong Lompot and Tanjong Balau, about 1½ miles northward, the coast forms a bight, in which there is a rock, which dries 4 feet (1m2), close northward of Tanjong Lompot, and a rock, 3 feet (0m9) high, close offshore about 9 cables south-westward of Tanjong Balau. A group of rocks, the highest of which has an elevation of 10 feet (3m0), lies close offshore, about half a mile north-westward of Tanjong Balau. About 2½ miles north-north-westward of Tanjong Balau is Tanjong Siang; several rocks, which dry from one to 4 feet (0m3 to 1m2), lie within 6 cables southward of the latter point.

The coast between Tanjong Siang and Tanjong Klesa (Kelesom), 4 miles north-north-westward, is bordered by trees, about 140 feet (42m7) high. A rock, 4 feet (1m2) high, lies close offshore about 6 cables south-south-westward of Tanjong Klesa. A bank, with depths of less than one fathom (1m8) over it, extends about 3 cables south-eastward from Tanjong Klesa; a patch, which dries 6 feet (1m8), lies on the outer edge of this bank. A rock, 2 feet (0m6) high, with a rock, awash, close northward of it, lies about 2 cables north-north-eastward of Tanjong Klesa.

The coast between Tanjong Klesa and Tanjong Sedili Kechil, about

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Chart 3839.

10 miles north-north-westward, is backed by hills close inshore ; Bukit Gemoh (Gemok), 330 feet (100m6) high to the tops of the trees, lies about 3 miles north-north-westward of Tanjong Klesa and about 3½ cables inland. Several patches, which dry from 3 to 7 feet (0m9 to 2m1), lie close offshore within one mile north-eastward of Bukit Gemoh.

Chart 1367.

Jason bay.—Dangers.—Jason bay is entered between Tanjong Sedili Kechil, which is 278 feet (84m7) high to the tops of the trees, and Tanjong Sedili Besar, 153 feet (46m6) high to the tops of the trees, about 4 miles north-north-westward. A reef extends about three-quarters of a mile eastward from Tanjong Sedili Kechil, and foul ground, near the outer end of which are two rocks, 12 and 8 feet (3m7 and 2m4) high, extends about one mile south-eastward from Tanjong Sedili Besar. A rock, one foot (0m3) high, lies about 2 cables eastward of the point.

Sungei Sedili Kechil, which has a depth of one foot (0m3) in its entrance, discharges into the southern end of the bay close westward of Tanjong Sedili Kechil. Sungei Sedili Besar discharges into the northern end of the bay ; it is fronted by a bar, which is subject to change, with a least depth of one foot (0m3) over it. A stranded wreck was reported, in 1949, to lie on the bar, 6½ cables southward of Tanjong Sedili Besar. The entrance lies between Tanjong Sedili Besar and Pulau Tagal, a densely wooded island, about 4½ cables westward ; about 1¼ cables north-north-eastward of Pulau Tagal is a reef on which are two rocks, the northern of which is 2 feet (0m6) high ; between this reef and Tanjong Lembu, about 1¼ cables westward, there is some foul ground, with a narrow channel between it and the reef. At Kampong Sedili Besar, a fishing village on the eastern side of the entrance to Sungei Sedili Besar, there is a wooden jetty with the Customs house close to it.

The tidal streams run at a rate of from 2 to 3 knots, but the rate of the out-going stream is accelerated when the river is in flood. The river is tidal as far as Mawai, about 20 miles from the entrance.

Chart 769.

Bank.—A bank, with a least depth of 27 feet (8m2) over it, lies off the entrance to Jason bay, about 2¾ miles eastward of Tanjong Sedili Besar, and extends, with depths of less than 6 fathoms (11m0) over it, about 5 miles northward from this position.

Coast.—The coast between Tanjong Sedili Besar (*Lat. 1° 55′ N., Long. 104° 08′ E.*) and Tanjong Petai, about 9 miles north-north-westward, is fringed by a bank, with depths of less than 3 fathoms (5m5) over it, and on which are several sunken rocks, extending as much as 8 cables offshore. Between Tanjong Petai and Tanjong Leman, 6½ miles north-north-westward, the coastal bank, with depths of less than 3 fathoms (5m5) over it, extends as much as 1¼ miles offshore ; a rock, 3 feet (0m9) high, lies on this bank about 8 cables offshore, about 3 miles south-south-eastward of Tanjong Leman, and a patch, which dries 7 feet (2m1), lies about half a mile offshore and 1¾ miles south-south-eastward of the same point.

The coast between Tanjong Penawar and Tanjong Leman is mostly low and densely wooded, with a few clearings, extending to the beach. The only portion that can be readily distinguished is Jason bay.

The coast between Tanjong Leman and Tanjong Tenggaroh, about

Charts 3543, 1355, 2660a, 1263.

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Chart 769.

6 miles north-north-westward, is fringed by a bank, with depths of less than 3 fathoms (5m5) over it, extending from one to 2½ miles offshore; some rocks, with a depth of less than 6 feet (1m8) over them, extend about 8 cables offshore about 2 miles north-north-westward of Tanjong Leman.

Light.—A light is exhibited, at an elevation of 275 feet (83m8), from a concrete building, 13 feet (4m0) in height, situated on Tanjong Tenggaroh.

Off-lying islands and dangers.—Pulau Yu, a bluff, wooded islet, 156 feet (47m5) high, lies about 12 miles east-north-eastward of Tanjong Petai, and is the south-easternmost of a chain of islets and dangers which lies parallel with the coast.

Tokong Chopak, Tokong Blalang, 100 feet (30m5) high, Tokong Chondong, 135 feet (41m1) high, and Tokong Gantang, 95 feet (29m0) high, lie from 3½ to 6 miles north-westward of Pulau Yu. A reef, the position of which is approximate, and Karang Ambong, with a depth of less than 6 feet (1m8) over it, lie about 8 cables and 2 miles, respectively, north-westward of Tokong Gantang. Pulau Lima Besar, 155 feet (47m2) high, lies about 2 miles north-north-westward of Tokong Gantang, and Raket, consisting of two rocks, one of which is 90 feet (27m4) high, lie about half a mile east-south-eastward of Pulau Lima Besar. Pulau Lima Kechil lies close northward of the western extremity of Pulau Lima Besar, and Tokong Sangoe, 6 feet (1m8) high, lies about 8 cables westward; a bank, with a depth of 17 feet (5m2) over it, extends a short distance from the western side of Tokong Sangoe.

There is a channel, with a least depth of about 9½ fathoms (17m4), between the chain of islets and dangers described above and the Sibu group of islands.

Pulau Sibu, the largest of the Sibu group, is 503 feet (153m3) high near its south-eastern end, and lies with its south-eastern extremity about 4 miles west-south-westward of Pulau Lima Besar. Pulau Sibu Tengah and Pulau Sibu Kukus, together with other rocks, above and below water, lie on the north-eastern side of a bank which extends about 2 miles south-eastward from the south-eastern extremity of Pulau Sibu. Several rocks, with depths of less than 6 feet (1m8) over them, lie close off the southern side of the island. There is a shallow bay encumbered with numerous dangers on the western side of the island.

The north-western side of Pulau Sibu (*Lat. 2° 13′ N., Long. 104° 04′ E.*) is steep-to. A bank, with depths of less than 6 fathoms (11m0) over it, extends about 2½ miles northward from the northern extremity of Pulau Sibu; a patch, which dries 8 feet (2m4), lies close off this point.

Sibu channel, between the Sibu group and the Malay coast, is about 3 miles wide between the 3-fathom (5m5) lines on either side, and has depths of from 33 to 50 feet (10m1 to 15m2) in the fairway.

Pulau Tinggi, 1,999 feet (609m3) high, lies about 4 miles north-eastward of Pulau Sibu. There is a village on the south-western side of the island; there are about 80 inhabitants. A bank, with depths of less than 10 fathoms (18m3) over it, extends about 3½ miles south-south-eastward from the southern side of the island; foul ground extends about 8 cables from the same side. Pulau Simbang lies about 1½ miles south-eastward of the southern extremity of the island; two rocks above water and a sunken rock lie within three-quarters of

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Chart 769.

a mile north-eastward of Pulau Simbang. Pulau Iboi lies about 4 cables off the north-eastern side of Pulau Tinggi, with Pulau Penyabong about midway between them; sunken rocks extend a short distance off the eastern side of Pulau Iboi.

Gebang rocks, visible at low water springs in fine weather, and on which the sea breaks in the North-east monsoon, lie about one mile northward of Pulau Tinggi. Siam knoll, with a depth of less than 6 feet (1m8) over it, lies about three-quarters of a mile northward of the north-western extremity of the same island.

Batu Murau, which is steep-to, lies about 3¾ miles westward of Pulau Tinggi.

Anchorages.—A good anchorage for vessels with local knowledge is in a depth of about 5½ fathoms (10m1), sheltered from the North-east monsoon, westward of the reef extending from the western side of Pulau Sibu, with the summit of Pulau Tinggi bearing 028°.

Anchorage can also be obtained by vessels with local knowledge in the bay on the eastern side of Pulau Sibu, in a depth of 6 fathoms (11m0).

Anchorage may be obtained by vessels with local knowledge in Pinang bight, on the south-eastern side of Pulau Tinggi.

Coast.—Tanjong Murau lies about 3¾ miles north-north-westward of Tanjong Tenggaroh; these points are both prominent and may easily be identified. About 2½ miles farther north-westward is Tanjong Sekakap, 283 feet (86m3) high.

Mersing.—Lights.—Beacons.—The town of Mersing which had a population, in 1940, of about 6,000, is situated at the mouth of Sungei Mersing, which discharges about 8 miles north-westward of Tanjong Sekakap (*Lat. 2° 21′ N., Long. 103° 56′ E.*).

A light is exhibited, at an elevation of 20 feet (6m1), from an iron framework tower, situated on the southern side of the entrance to Sungei Mersing; this light is difficult to distinguish from the lights in the town.

Chawang rock, 20 feet (6m1) high and reddish in colour, situated on the southern side of the river entrance, and a meteorological hut with a flagstaff, standing on the summit of a small hill about one mile north-westward of the light-tower, are prominent landmarks.

Two beacons are situated outside the harbour entrance. A light is exhibited, at an elevation of 20 feet (6m1), from the outer beacon; the inner beacon is distinguished by a red topmark.

The river should be approached on the alignment of the inner beacon with the south-eastern extremity of Pulau Stindan (*see* below), and thence direct for the river entrance; there is a depth of one foot (0m3) on the bar. The flood stream sets strongly up the river.

Vessels usually anchor with Mersing light-tower bearing about 221°, according to draught; the bottom is mud.

The river is about half a cable wide at its entrance. The Customs wharf, a concrete structure, alongside which there is a depth of 8 feet (2m4) at high water, is situated on the southern side of the river, close inside the entrance.

Small steamers occasionally call at Mersing, which is connected to the general telegraph and telephone systems.

Coast.—Light.—Pulau Stindan (*Lat. 2° 29′ N., Long. 103° 51′ E.*), 280 feet (85m3) high, lies about 2½ miles northward of Mersing, and on

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Chart 769.

the outer edge of the coastal bank which extends about 1¾ miles offshore.

A light is exhibited, at an elevation of 26 feet (7m9), on the south-eastern extremity of Pulau Stindan.

Pulau Batu Gajah consists of two rocks lying about one mile northward of the light-structure on Pulau Stindan.

Tanjong Silantai, rising close within to an elevation of 469 feet (142m9), lies about 4¼ miles northward of Mersing. Between Tanjong Silantai and Tanjong Resang, about 4¾ miles north-north-westward, the coast forms two bights, separated about midway by Tanjong Arong, from which foul ground extends about a quarter of a mile. Pulau Puchong, 20 feet (6m1) high, lies about 8 cables southward of the eastern extremity of Tanjong Resang, and about half a mile offshore of the northern bight.

Between Tanjong Resang and Tanjong Penyabong, 5¼ miles north-westward, the coast forms two bights, separated by Pulau Mawar, 277 feet (84m4) high and covered with dense jungle, lying on the coastal bank about 2 miles south-eastward of Tanjong Penyabong and about 4 cables offshore. In the south-eastern bight there is a rock, with a depth of less than 6 feet (1m8) over it, and two rocks, 6 feet (1m8) high, lying close together about 1½ miles and three-quarters of a mile, respectively, south-eastward of Pulau Mawar. A sunken rock lies close off the south-eastern extremity of the same island.

Malang Gading, two groups of rocks, 1½ cables apart, of which the northern is 8 feet (2m4) and the southern 4 feet (1m2) high, lie just outside the 3-fathom (5m5) line about one mile northward of the north-western extremity of Pulau Mawar. Pulau Acheh, about 2¼ miles northward of Pulau Mawar, has several summits, the highest of which has an elevation of 520 feet (158m5), and is covered with dense jungle. There are bays with sandy shores on the western side. A spit extends a short distance southward from the southern extremity, and close outside it is Batu Berdawan, with a depth of less than 6 feet (1m8) over it. Foul ground extends a short distance from the north-eastern side of the island. Pulau Acheh is uninhabited though frequently visited by natives.

Blair harbour.—Dangers.—Blair harbour is situated westward of Pulau Acheh and may be entered by small vessels with local knowledge from south-eastward or from north-eastward. The south-eastern entrance lies between Tanjong Penyabong and Pulau Acheh, passing westward of Batu Berdawan in a least depth of 23 feet (7m0) in the fairway, but the channel is very narrow. The entrance from north-eastward lies between the northern extremity of Pulau Acheh and Pulau Tunus, a group of three islets about one mile north-westward. These islets are steep-to and sparsely covered with vegetation, the highest having an elevation of 120 feet (36m6); the channel is much contracted by the dangers on either side and has depths of from 6 to 7 fathoms (11m0 to 12m8).

Pulau Tengah (*Lat. 2° 40′ N., Long. 103° 45′ E.*), 250 feet (76m2) high, lies near the northern edge of the bank with depths of less than 3 fathoms (5m5) over it, extending about one mile from the northern side of Tanjong Penyabong. Pulau Lalang, 125 feet (38m1) high, lies on the southern side of the harbour about 2¼ miles west-south-westward of Pulau Tengah. Batu Doyak, which dries 6 feet (1m8), lies about

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Chart 769.

1½ miles north-westward of Pulau Tengah. Pulau Layak, 255 feet (77m7) high at its south-eastern end, lies about three-quarters of a mile north-westward of Pulau Tunus; the summit of the island is covered with low jungle, and the remainder with grass and low scrub. Landing is practicable at the south-eastern end of the south-western side.

Several shoals, with depths of from 24 to 27 feet (7m3 to 8m2) over them, lie within one mile north-westward of Pulau Layak.

Anchorage.—Blair harbour is safe for small craft, sheltered from the prevailing winds, with anchorage in a depth of 4 fathoms (7m3), stiff mud.

Off-lying islands and dangers.—Pulau Babi Besar lies about 9 miles north-westward of Pulau Tinggi (page 63) and about 6 miles off the coast of the Malay peninsula; near its southern end are two peaks, the northern of which is 824 feet (251m1) high. A bank, with depths of from 3 to 4 fathoms (5m5 to 7m3) over it, extends about 1½ miles south-south-westward from the island.

Batu Tikus, above water, with detached rocks around it, lies about 3½ miles eastward of the south-eastern extremity of Pulau Babi Besar. Batu Sakit Mata, awash, lies about 2½ miles eastward of the northern extremity of the same island.

Pulau Babi Kechil (South), 276 feet (84m1) high, lies about 1½ miles north-north-westward of Pulau Babi Besar, and Pulau Babi Kechil (North), 354 feet (107m9) high, lies about 6 cables farther in the same direction. A sunken rock lies close northward of Pulau Babi Kechil (North), and a rock above water lies about half a mile north-eastward.

Pulau Rawa, 267 feet (81m4) high, lies about 2 miles north-eastward of Pulau Babi Kechil (North). From Pulau Rawa a chain of islets and rocks extends about 3 miles north-westward, consisting of Pulau Kalabang, 75 feet (22m9) high, Pulau Goal, 188 feet (57m3), Pulau Mensirip, and Pulau Harimau, 295 feet (89m9). A rock, awash, lies about 4 cables west-north-westward of Pulau Goal.

Pulau Sribuat, 459 feet (139m9) high, lies about 7 miles north-north-westward of Pulau Harimau. Pulau Sembilang, 739 feet (225m2) high to the tops of the trees, is connected to the western side of Pulau Sribuat (*Lat. 2° 41′ N., Long. 103° 55′ E.*) by a reef, on which are rocks, above and below water. Santu, an islet, 239 feet (72m8) high, lies close off the north-eastern point of Pulau Sribuat.

Four islets, the largest and north-westernmost of which is named Pulau Achi, 171 feet (52m1) high, lie about 1½ miles southward of Pulau Sembilang.

Anchorage.—Anchorage may be obtained off the western side of Pulau Babi Besar at the southern end, in a depth of not less than 8 fathoms (14m6).

General directions.—Directions for leaving and approaching Singapore strait are given in the Malacca Strait Pilot.

Tidal streams.—The tidal streams generally set along the coast at a rate not exceeding 1½ knots. During prolonged strong winds the tidal streams are masked by the currents set up by them; in particular the current sets southward during the North-east monsoon and northward during the South-west monsoon. For example, in July 1940, a north-westerly set of 2¼ knots over a period of 12 hours was experienced between the entrance to Singapore strait and Pulau Tioman, the vessel passing eastward of Pulau Aur.

Charts 3543, 1355, 2660a, 1263.

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To face page 67.

Pulau Pemanggil, bearing 203°, distant about 45 miles.

(*Original dated* 1872.

Pulau Tioman, bearing 215°, distant about 12 miles.

Pulau Tenggol, bearing about 215°, distant 6 miles.

(*Originals dated* 1872.)

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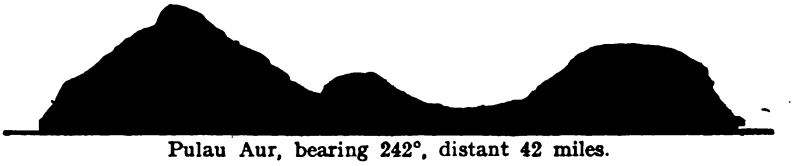
Chart 769.

Outlying islands.—Dangers.—North-eastward of the off-lying islands described on pages 63-64 is another chain of islands lying nearly parallel with the Malay coast at a distance of about 25 miles. *Charts 769, 3543.*

Pulau Aur, about 24 miles east-north-eastward of Pulau Tinggi (page 63), is the south-easternmost of this chain of islands, and lies on the western side of the main fairway of the China sea; between Pulau Aur and Damar (Domar), the westernmost of Anambas eilanden (page 78), the channel is about 53 miles wide. Pulau Aur, thickly wooded and apparently steep-to, has two peaks, the southern and higher being 1,805 feet (550m1) high and dome-shaped, and the northern, 1,521 feet (463m6) high. On a north-easterly or south-westerly bearing it has the appearance of two islands when viewed at a great distance, and resembles a saddle on a nearer approach.



Pulau Aur, bearing 242°, distant 42 miles.
(*Original dated* 1942.)

Pulau Aur is inhabited and there are numerous huts on the shore of Telok Tokaya. *See* below.

Pulau Pinang, covered with trees, lies about three-quarters of a mile from the south-eastern side of Pulau Aur. Pulau Dyang, 545 feet (166m1) high, is separated from the north-western side of Pulau Aur by a narrow channel, with a least depth of 13 fathoms (23m8) in the fairway. Pulau Lang lies about a quarter of a mile south-westward of Pulau Dyang (*Lat. 2° 28′ N., Long. 104° 30′ E.*).

Chart 769.

Pulau Pemanggil lies about 11½ miles north-westward of Pulau Aur; it has two peaks, the south-eastern one being 1,507 feet (459m3) high, and the north-western, 1,227 feet (374m0). *See* view facing this page.

Anchorages.—Telok Tokaya (Toh Kyahs), on the south-western side of Pulau Aur, affords shelter to vessels with local knowledge during the North-east monsoon, when the wind is between north and east-south-east. A good position is with Pulau Lang in line with the north-western entrance point of the bay, in a depth of 20 fathoms (36m6), sand, about half a mile offshore; within a depth of 20 fathoms (36m6) the coastal bank is steep.

The bay situated on the south-western side of Pulau Pemanggil affords anchorage to vessels with local knowledge, in depths of from 18 to 19 fathoms (32m9 to 34m7) about one mile offshore.

Pulau Tioman.—Pulau Tioman, situated with Tanjong Berhala, its south-eastern extremity, about 9½ miles north-westward of Pulau Pemanggil, is mountainous, its summit, named Gunong Kajang, attaining an elevation of 3,383 feet (1,031m1) (*see* view facing this page). Pulau Tioman forms part of the Pekan district of the State of Pahang and is inhabited by Malays.

Southern and western sides of Pulau Tioman.—Telok Mokut lies between Tanjong Berhala and Chula Naga or Ass's Ears (*Lat.*

Charts 1355, 2660a, 1263.

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Chart 769.

2° 43′ N., Long. 104° 10′ E.), about **3** miles westward; the latter, named from their aspect, are two remarkable peaks close together, rising almost vertically from the sea to an elevation of 2,530 and 2,477 feet (771m1 and 755m0), respectively. There is a village on the shore of Telok Mokut, which is sandy. Telok Nipah, the shore of which is sandy, and through which two fresh water streams discharge, is entered about 1½ miles west-north-westward of Chulu Naga.

Telok Tekek (Tengah) lies on the north-western side of Pulau Tioman, and is reported by the natives to be clear of danger. Pulau Paya lies close off the south-western entrance point. A shoal was reported, in 1950, to lie in this bay.

Anchorages.—Directions.—Telok Mokut affords anchorage to vessels with local knowledge during fine weather, in depths of from 20 to 22 fathoms (36m6 to 40m2), sand.

Telok Nipah affords better shelter than Telok Mokut in the North-east monsoon. Vessels with local knowledge intending to anchor in Telok Nipah when coming from northward, should pass close round the north-western end of Pulau Tioman, between it and the dangers extending southward from Pulau Tulai; they should then keep from 1½ to 2 miles from the western coast of Tioman. The depths will be found to decrease gradually in Telok Nipah to 10 or 9 fathoms (18m3 or 16m5), sand and gravel; the best berth is in a depth of 15 or 16 fathoms (27m4 or 29m3), about half a mile offshore.

There is good anchorage in Telok Tekek during the South-west monsoon.

H.M.S. *Grimsby*, in September, 1936, anchored about **3** cables off a village on the coast of Telok Tekek, with Pulau Paya bearing 237°, in a depth of 11 fathoms (20m1), and reported that when approaching this anchorage the depths in the bay decrease very rapidly from a depth of 20 fathoms (36m6).

Telok Salang is entered between the northern entrance point of Telok Tekek and the north-western point of the island.

Off-lying islets and dangers.—Pulau Gut, 145 feet (44m2) high and wooded, with a high rock close southward of it, lies 3¾ miles south-westward of Tanjong Berhala. Batu Sepoy, with a depth of 9 feet (2m7) over it, lies about 6 cables northward of Pulau Gut, and a 10-fathom (18m3) patch lies about 2½ miles west-north-westward of the same islet. Pulau Tokong Bara, 181 feet (55m2) high, lies about 6½ miles westward of Pulau Gut. Some rocks, with depths of less than 6 feet (1m8) over them, lie within half a mile northward of Pulau Tokong Bara (*Lat. 2° 40′ N., Long. 104° 04′ E.*).

Burong, an islet, 168 feet (51m2) high, lies about 9½ miles north-westward of Pulau Tokong Bara; close southward of Burong are some rocks above water, one of which is 124 feet (37m8) high.

A shoal, about half a mile long, with a depth of less than 6 feet (1m8) over it, the position of which is approximate, was reported, in 1941, to lie about 7½ miles east-north-eastward of Burong.

Pulau Labas, 64 feet (19m5) high, lies about 9 miles north-eastward of Burong. A rock, with a depth of less than 6 feet (1m8) over it, lies close eastward of Pulau Labas. Pulau Sepoi, 248 feet (75m6) high and wooded, lies about one mile north-westward of Pulau Labas. Pulau Tulai, 401 feet (122m2) high, lies about 2¾ miles west-north-westward of the north-western point of Pulau Tioman. A rock above water and

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Chart 769.

some rocks, with depths of less than 6 feet (1m8) over them, lie within one mile southward of Pulau Tulai. Pulau Tulai is sparsely populated. On the western side of the island there is a bay, from the southern entrance point of which a reef appears to extend about 2 cables offshore.

Anchorage may be obtained by vessels with local knowledge in the bay on the western side of Pulau Tulai, in a depth of 10 fathoms (18m3), coral and sand, but the rocks extending from the southern entrance point should be avoided.

Pulau Chebeh, 237 feet (72m2) high, lies about half a mile north-north-westward of Pulau Tulai.

Chart 1394, plan of Joara bay.

Telok Juara.—Telok Juara (Joara), on the eastern side of Pulau Tioman, is entered between One Tree point, 6 miles south-south-eastward of Tanjong Salang, the northern extremity of the island, and South point, about 1½ miles south-south-eastward. Several rocks, the highest of which has an elevation of 15 feet (4m6), extend about 1¾ cables south-south-eastward from a point about 1½ cables south-south-westward of One Tree point (*Lat. 2° 48′ N., Long. 104° 13′ E.*). There is a good landing place in the South-west monsoon within the mouth of a fresh water stream about half a mile westward of One Tree point; another fresh water stream discharges close northward of Black rock, situated on the beach near the middle of the head of the bay. The best landing place is at the mouth of a fresh water stream about three-quarters of a mile westward of South point; this stream can be ascended by a boat at high water for a distance of 2 or 3 cables. The water from these streams should be treated if required for drinking purposes. Many natives reside in huts built along the beach, where there are numerous coconut trees; elsewhere the shore of the bay is covered by dense jungle.

Anchorage may be obtained, though not too well sheltered, during the South-west monsoon, in depths of from 6 to 10 fathoms (11m0 to 18m3), over a sandy bottom; the most sheltered anchorage is in the south-western portion of the bay.

In 1947, H.M.S. *Penn* anchored in the bay with Black rock bearing 286°, distant 5½ cables, in a depth of 9½ fathoms (17m0), mud and sand, good holding ground; smaller craft, with a draught of about 10 feet (3m0), can anchor close to the southern part of the beach. The larger types of native craft handle cargo from a position about 4 cables southward of Black rock.

Telok Juara is connected to Telok Tekek (page 68) by a narrow footpath which crosses the island from a position about 4 cables northward of Black rock.

Tidal streams.—Along the western side of Pulau Tioman, the tidal streams set northward and southward at rates of from one to 1½ knots at times.

Submarine exercise area.—A submarine exercise area has been established north-north-eastward of Pulau Tioman. A good look-out should be kept for submarines in the area between the meridians of 104° 20′ E. and 104° 30′ E. on the parallel of 3° 07′ N.

Chart 769.

Coast. — Beacons. — Dangers. — Kuala Endau is entered close eastward of Tanjong Gemuk, about 7½ miles westward of Tanjong

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Chart 769.

Penyabong. It is obstructed by a bar, with a depth of about 3 feet (0m9) over it, which extends 1½ miles offshore. Both banks of Sungei Endau are thickly wooded, where not cleared, and during the rainy season the right bank is generally submerged. The channel is marked by beacons, the outer ones white, the inner ones red, surmounted by cylindrical drums. Only vessels with local knowledge should attempt to enter the river.

The small town of Endau stands on the right bank, about one mile from the entrance; there are two jetties.

Iron ore and tin are exported from the mines in the vicinity.

Robb shoals, with a least depth of 2 fathoms (3m7) over them, lie about 2½ miles northward of the entrance to Sungei Endau.

Sungei Pontian and Sungei Rompin discharge about 10 and 14 miles, respectively, north-westward of Kuala Endau. Pulau Duchong Darat and Pulau Duchong Laut lie about 4 and 8 cables, respectively, offshore about 2½ miles south-eastward of Kuala Pontian. Some sunken rocks lie close offshore about half a mile south-eastward of Pulau Duchong Darat. Boya rock, awash, lies about 3 miles eastward of Pulau Duchong Darat (*Lat. 2° 45′ N., Long. 103° 34′ E.*) and the same distance offshore.

Chart 1394, plan of entrance to Sungei Rompin.

Sungei Rompin.—Caution.—Light.—The mouth of Sungei Rompin is fronted by a bar, with a least depth of 4 feet (1m2) over it, lying between sandbanks which dry from one to 2 feet (0m3 to 0m6).

The fairway across the bar is occasionally marked with small brushwood beacons by local fishermen, but these are unreliable and no attempt should be made to enter the river without local knowledge. A sharp look-out must be kept at all times for water-logged tree trunks which are commonly met with on the bar and in the river. During the North-east monsoon entrance to the river is often impossible.

Within the river the depths increase and, when clear of the shoal area fronting the town, the river is thereafter navigable by small craft for a distance of about 140 miles.

A light is exhibited, at an elevation of 40 feet (12m2), from a wooden framework structure, surmounted by a white square daymark, 40 feet (12m2) in height, about three-quarters of a mile east-south-eastward of Tanjong Tongkang, the eastern entrance point of Sungei Rompin.

Kampong Rompin is situated close within the entrance, on the southern bank of the river. In 1948, the exports were dried fish and hardwood. Small quantities of fish, pig, poultry and vegetables are obtainable locally.

Chart 769.

Coast.—Dangers.—Light.—Margaret shoal, the position of which is doubtful, is charted about 3 miles offshore and 9½ miles northward of the light-structure at Kuala Rompin. The brig *Margaret*, in January, 1827, reported a depth of 3 fathoms (5m5) near the above position. There was a heavy swell on and the sea was breaking at a distance of half a cable inshore. The trees close to the beach were visible from the deck, and between the shoal and the mainland there appeared to be greater depths.

A light, named Nenasik, is exhibited, at an elevation of 30 feet (9m1), from a wooden framework tower, surmounted by a white square daymark, situated near the root of the sandspit forming the north-

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Chart 769.

eastern side of the entrance to Sungei Bebar, about 19 miles northward of Kuala Rompin.

Tanjong Batu, 146 feet (44m5) high, lies about 4¾ miles northward of Nenasik light-structure.

Wardlaw shoals, consisting of patches of coral rising steeply from the bottom, with a least depth of 4 feet (1m2) over them, lie 15½ miles northward of Tanjong Batu and about 2½ miles offshore. The area southward of them has not been examined, and the shoals may extend in that direction.

The coast from abreast these shoals to Kuala Pahang, about 4 miles north-north-eastward, is densely wooded. In 1950, erosion was taking place along this stretch of coast.

Outlying islet and dangers.—Pulau Berhala, 92 feet (28m0) high, and wooded, lies 13 miles east-north-eastward of Tanjong Batu; the islet is steep. A ledge of rocks, about 3 feet (0m9) high, and over which the sea breaks in bad weather, extends about 3½ cables north-westward from the islet.

About 9 miles eastward of Pulau Berhala is a shoal with a depth of 6 fathoms (11m0) over it, and steep-to; between the islet and the shoal there are depths of 13 and 14 fathoms (23m8 and 25m6), sand and mud.

The western end of a rocky shoal, which has a depth of 5 fathoms (9m1) over it, with overfalls and steep-to, lies about 4 miles northward of Pulau Berhala and extends about 6 miles east-north-eastward.

In the channel between Pulau Berhala and the coast of Malay the bottom is hard sand in some places, and depths of 5 and 6 fathoms (9m1 and 11m0) extend as far as 11 miles from the mainland coast.

Chart 1394, plan of entrance to Pahang river.

Sungei Pahang.—Light.—Buoy.—Sungei Pahang is entered between Tanjong Agas (*Lat. 3° 30′ N., Long. 103° 28′ E.*), about 18 miles northward of Tanjong Batu, and a point about 1½ miles northward. Pulau Syed Hassan lies in the middle of the entrance. The southern mouth thus formed is obstructed by drying sandbanks which extend about one mile offshore and a considerable distance southward, and is only used by local fishing craft. There is a least depth of one foot (0m3) over the bar. The northern mouth is also obstructed by a bar, which lies about half a mile outside the entrance, and over which there is a least depth of 2 feet (0m6). There are drying sandbanks extending seaward from each side of the entrance.

Pulau Syed Hassan light is exhibited, at an elevation of 42 feet (12m8), from a white tower, 40 feet (12m2) in height, about 7 cables east-south-eastward of the northern entrance point of Sungei Pahang.

A small can buoy is moored 8 cables northward of Pulau Syed Hassan lighthouse.

Anchorage.—Directions.—Anchorage may be obtained outside the bar, in a depth of 4½ fathoms (8m2), mud and sand, with the light-house bearing 186°, distant about 1¼ miles.

To cross the bar of the northern mouth a vessel should pass close northward of the can buoy, and thence steer to pass about 200 feet (61m0) southward of the drying sandbank on the northern side, thence she should steer along the northern bank. Inside the entrance the river is shallow and local knowledge is necessary as the banks are constantly changing.

Charts 3543, 1355, 2414, 2660a, 1263.

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Chart 1394, plan of entrance to Pahang river.

Tidal streams.—The tidal streams in the approach to Sungei Pahang are weak.

Kampong Kuala Pahang.—Kampong Kuala Pahang stands close inside the entrance on the northern bank. There is a Custom house and a police station, and the village is connected to the general telegraph and telephone systems. Fish and coconuts are exported.

Pekan (chart 3543), a town with about 1,000 inhabitants, is situated about 5 miles up the river on the southern bank. The Sultan of the State of Pahang resides here.

Chart 769.

Coast.—Danger.—The coast north-westward of Kuala Pahang is thickly wooded. Batu Serandu, a rocky patch, with a least depth of 17 feet (5^{m}2) over it, lies about 1¾ miles north-north-westward of Kuala Pahang and three-quarters of a mile offshore.

Chart 3543.

Between here and Tanjong Tembeling, situated about 18 miles north-north-westward, there is a bight in the coast which has not been surveyed, but there are depths of from 8 to 9 fathoms (14^{m}6 to 16^{m}5) on the line joining its entrance points. The coast is low and thickly wooded.

Outlying shoal.—A shoal, with a depth of 6 fathoms (11^{m}0) over it, sand and coral, lies about 24 miles east-south-eastward of Tanjong Tembeling; depths of 7 fathoms (12^{m}8) extend about 5 miles north-westward from the shoal, and less depths may exist.

Chart 1397, plan of Approaches to Sungei Kuantan.

Off-lying dangers.—Karang Tanjong, with a least depth of 16 feet (4^{m}9) over it, sand, shell and shingle, lies with its shoalest part about 3 miles south-eastward of Tanjong Tembeling, and extends, with depths of less than 36 feet (11^{m}0), about 3½ miles north-eastward. Two 18-foot (5^{m}5) patches lie about 1¾ miles southward and 2¼ miles south-south-westward, respectively, of Tanjong Tembeling.

Sungei Kuantan. — Lights. — Beacons. — Buoyage. — Sungei Kuantan is entered about 1¾ miles westward of Tanjong Tembeling. This point rises to an elevation of 333 feet (101^{m}5) about 3 cables northward, and the land farther northward and westward of it attains an elevation of about 1,200 feet (365^{m}8).

Between Tanjong Tembeling and Tanjong Api, about 1½ miles westward, Telok Sisek bank, which dries from one to 6 feet (0^{m}3 to 1^{m}8), extends about 1¾ miles south-south-westward, and a bank, which dries from one to 5 feet (0^{m}3 to 1^{m}5), extends as much as three-quarters of a mile from the western side of the entrance. The channel over the bar lies between these two banks and is marked by leading light-beacons, light-buoys, and buoys, which are moved as necessary; there are also some fishing stakes on both banks, the positions of which may be seen on the chart.

The depth over the bar was one foot (0^{m}3) in 1950, but the bar is of a shifting nature and depths and channel are subject to change. A prevailing south-easterly swell causes a choppy sea on the bar, particularly with the out-going stream, and passage across the bar, for shallow draught small craft, is especially difficult within 1½ hours on either side of the time of low water, except during calm conditions.

A conical light-buoy, painted red, exhibiting a *red flashing* light *every four seconds*, is moored 1¼ miles southward of the front light-beacon on Tanjong Api (*Lat. 3° 48′ N., Long. 103° 21′ E.*).

Charts 3543, 1355, 2414, 2660a, 1263.

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Chart 1397, plan of Approaches to Sungei Kuantan.

A can light-buoy, painted green, exhibiting a *green flashing* light *every three seconds*, is moored about 4½ cables southward of the front light-beacon on Tanjong Api.

A black buoy is moored at the southern extremity of the bank extending about 1½ miles southward from Tanjong Api. This buoy should be passed on the starboard hand on entering, and the two light-buoys on the port hand.

The approach to the bar is marked by a pair of light-beacons, painted white, surmounted by white circular daymarks, situated about 7 cables south-south-westward of Tanjong Api. The elevations of the beacons are 12 and 40 feet (3m7 and 12m2), respectively; in 1948, they stood about 60 yards (54m9) apart and their alignment was about 320°.

The approach to the river entrance is marked by a pair of light-beacons, painted white, surmounted by white diamond daymarks, situated on Tanjong Api. The elevations of these beacons are 21 and 37 feet (6m4 and 11m3), respectively; in 1946 their alignment was about 346°.

No reliance should be placed on any of the beacons, nor should any vessel enter the river without local knowledge.

A can light-buoy, painted in red and white chequers, and exhibiting a *white flashing* light *every four seconds*, is moored on the eastern side of the fairway, about 1¾ miles south-westward of Tanjong Tembeling (*Lat. 3° 48′ N., Long. 103° 22′ E.*). This light-buoy should be left on the port hand on entering.

Sungei Kuantan is entered between Tanjong Api and Tanjong Lumpor, about 2½ cables west-north-westward, southward of which there is a village; the town of Kuantan is situated on the north-western bank of the river, about one mile westward of Tanjong Api. In 1947, it was reported that the least depth in the river, between the bar and the town, was 12 feet (3m7), and that vessels of from 12 to 15 feet (3m7 to 4m6) draught could enter the harbour; in 1946, small craft and lighters drawing 4 feet (1m2) could navigate the river for a distance of about 20 miles to Pasir Kemudi. The river is the outlet of a considerable tin-mining industry.

Anchorages.—In 1947, H.M.S. *Cossack* anchored about 3½ miles south-south-eastward of Tanjong Tembeling, in a depth of 5 fathoms (9m1), mud.

Anchorage with good holding ground, mud and sand, is obtainable about 8 cables south-south-eastward of Tanjong Tembeling, in a depth of 5 fathoms (9m1).

Anchorage may be obtained southward of the oiling jetty at Kuantan.

Port facilities.—Communications.—The main wharf, with frontages of 45 and 41 feet (13m7 and 12m5), about 50 feet (15m2) apart, has depths of 4 feet (1m2) alongside, and there are depths of 16 feet (4m9) a short distance off. Water is laid on to the wharf.

A wharf, close south-westward of the main wharf, has frontages of 162 and 42 feet (49m4 and 12m8), about 30 feet (9m1) apart, with a depth alongside of 10 feet (3m0). This wharf is used for fuelling the river craft. There is a travelling hand crane with a lifting capacity of 6 tons.

On the northern bank of the river, about 6 cables west-north-westward of Tanjong Api (*Lat. 3° 48′ N., Long. 103° 21′ E.*), are several boat slips, but in 1947, they were in a dilapidated condition.

Charts 3543, 1355, 2414, 2660a, 1263.

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Chart 1397, plan of Approaches to Sungei Kuantan.

There is a small hospital at Kuantan.

A limited quantity of fresh provisions was obtainable, in 1946.

There is regular small steamer communication between Singapore and Sungei Kuantan.

Kuantan is connected to the general telegraph system.

Coast.—Between Tanjong Tembeling and Tanjong Pelindong, about 2 miles northward, there are two bights separated about midway by Tanjong Pelindong Tengah. The southern bight is named Telok Chempedak, and close southward of Tanjong Pelindong Tengah is Telok Tongkang. Foul ground extends about 1½ cables south-eastward from Tanjong Pelindong.

A 3-fathom (5^{m}5) patch lies about half a mile eastward of Tanjong Pelindong.

Chart 3543.

From a position about three-quarters of a mile northward of Tanjong Pelindong to Tanjong Gelang, about 8½ miles north-north-eastward, the coast forms a bight, which has not been examined. Beserah village stands on the coast about 1½ miles northward of Tanjong Pelindong. Bukit Gebing lies close north-westward of Tanjong Gelang, and Kampong Gebing stands on the north-eastern side of the same point.

Chart 1397, plan of Approaches to Sungei Kuantan.

Anchorage.—Anchorage may be obtained during the South-west monsoon off Beserah village, about three-quarters of a mile offshore, in a depth of about 4½ fathoms (8^{m}2).

Chart 3543.

Coast.—Telok Bagin, which has not been examined, is entered between Tanjong Gelang and Tanjong Geliga Besar (Guliga), about 13 miles northward. Bukit Tengah, 320 feet (97^{m}5) high, lies close northward of Tanjong Cherating, situated 10 miles northward of Tanjong Gelang. Pulau Ular lies about half a mile offshore and 6 miles north-north-westward of Tanjong Gelang.

Chart 1397, plan of Entrance to Sungei Kemaman.

The coast northward of Tanjong Geliga Besar for a distance of 3 miles consists of two sandy beaches, divided by Tanjong Geliga Kechil, a small rocky promontory, 2 miles northward of Tanjong Geliga Besar. Along these beaches, the foreshore is low and featureless, planted with coconuts and, inland, with jungle, cleared in places for cultivation. About 2 miles northward of Tanjong Geliga Besar is Bukit Geliga Che Akob, 355 feet (108^{m}2) high and covered with jungle, a quarter of a mile inland and visible from seaward.

Sungei Kemaman and approaches. — Dangers. — Buoy. — Lights.—Sungei Kemaman is entered about 3¼ miles northward of Tanjong Geliga Besar. The entrance is well marked by two pairs of leading light-beacons, and the channel inside by light-beacons. Vessels with a draught of 8 feet (2^{m}4) with local knowledge can enter the river. There is a pier, about 150 feet (45^{m}7) long, with a depth of 12 feet (3^{m}7) alongside, at Kampong Kuala Kemaman (*Lat. 4° 14′ N., Long. 103° 27′ E.*), on the western side of the entrance.

A light is exhibited, at an elevation of 343 feet (104^{m}5), from a white masonry tower, 31 feet (9^{m}4) in height, on the eastern side of the entrance to Sungei Kemaman.

Karang Tenok and Karang Kechil, each with a least depth of

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Chart 1397, plan of Entrance to Sungei Kemaman.

20 feet (6m1) over it, lie about 2½ and 2 miles, respectively, south-eastward of Sungei Kemaman light-tower.

A spherical buoy, painted in red and white bands, lies 4½ cables south-eastward of the main light-tower.

Two leading lights are exhibited from posts, each surmounted by a rectangular daymark, about half a mile westward of Batu Pajajat, a rocky spur joined to the mainland, lying close off the eastern entrance point. In line they lead through the outer channel from seaward, and, in 1947, were in line, bearing 285°, but the posts are moved without notice to meet the changes in the channel.

The inner part of the entrance channel is marked by two leading lights, each exhibited from a white wooden framework tower surmounted by a white rectangular daymark, about 5½ cables north-eastward of the outer pair of leading light-beacons. In 1947, they were in line, bearing 350°. Four light-beacons are situated in the river in the north-eastern approach to Chukai; their lights are occasionally exhibited.

Tanjong Berhala, a low promontory, lies about 1½ miles north-eastward of Sungei Kemaman light-tower, at the northern end of Telok Menkuang, the shore of which, with Kampong Telok Menkuang at the middle, is cultivated with coconuts. Inland, the land rises gradually to a range of jungle-covered hills, 440 feet (134m1) high.

Batu Timbol, a rock with a least depth of 4 feet (1m2) over it, lies about 1½ miles north-eastward of Sungei Kemaman light-tower.

Heavy breakers, with clear water all round, were reported, in 1936, in a position about 1½ miles east-north-eastward of Sungei Kemaman light-tower (*Lat. 4° 14′ N., Long. 103° 27′ E.*) and half a mile offshore. The breakers are known locally as Batu Belachan.

Chukai.—Chukai, a village situated on the south bank about 2 miles within the entrance to Sungei Kemaman, is one of the principal ports of Trengganu. It is connected to the general telegraph and telephone systems. During the North-east monsoon the working of cargo by lighters is frequently impracticable.

Chart 3543.

Coast.—The coast between Tanjong Berhala and Tanjong Kabong, about one mile northward, is indented by two small sandy bays; close inland between these points is a range of hills, about 430 feet (131m1) high, and covered with jungle. Between Tanjong Kabong and Tanjong Penunjok, about 3 miles northward, there are several coves. Several rocks, with depths of less than 6 feet (1m8) over them, lie close offshore about 1½ miles southward of Tanjong Penunjok, and one lies close eastward of the point.

Off-lying danger.—Howard shoal, reported by the ship *Janet Hutton*, in 1823, is rocky with a depth of 2½ fathoms (4m6) over it, and lies about 6 miles south-eastward of Tanjong Penunjok; less depths may exist, as the Malay fishermen stated there was only one fathom (1m8) on its centre. Its position is doubtful and there are no soundings around it.

Coast.—Lights.—Dangers.—Between Tanjong Penunjok and Tanjong Labohan, about 12 miles northward, there are two bays, separated by Kampong Kemasik.

Two leading lights are exhibited from white wooden framework towers, each surmounted by a diamond, at Kampong Kijal, situated

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Chart 3543.

about 2½ miles north-north-westward of Tanjong Penunjok, the front light at an elevation of 20 feet (6m1).

Two leading lights are exhibited from white wooden framework towers, each surmounted by a diamond, at Kampong Kemasik, the front light at an elevation of 20 feet (6m1).

Chart 1374.

A steep hill, 150 feet (45m7) high, lies on the coast at Kemasik. Between this hill and Kuala Kerteh, about three-quarters of a mile westward of Tanjong Labohan, the coast is sandy and backed by coconut plantations. Between Kuala Kerteh and Tanjong Labohan the coast forms a rocky promontory, rising to Bukit Labohan, 1,240 feet (378m0) high.

A small group of rocks, with a least depth of 3 feet (0m9) over them, lies about 6 cables northward of the 150-foot (45m7) hill, and 2 cables offshore.

A light is exhibited, at an elevation of 20 feet (6m1), at the entrance to Kuala Kerteh.

Anchorage may be obtained in any suitable depth eastward of the light-structure at Kuala Kerteh; the bottom is sand and shell and affords good holding ground. In the entrance to the river the channel dries one foot (0m3). Boat work is often difficult, even in a favourable monsoon, and it is always advisable to use a pulling boat near the time of low water.

Off-lying banks.—Caslon bank, with a least depth of 7½ fathoms (13m7) over it, lies outside the 10-fathom (18m3) line, about 5 miles south-eastward of Tanjong Labohan.

Winkworth bank, with a least depth of 8½ fathoms (15m1) over it, and Paton bank, with a least depth of 8½ fathoms (15m5) over it, lie about 3½ miles south-eastward and 3 miles north-eastward, respectively, of Tanjong Labohan (*Lat. 4° 32′ N., Long. 103° 28′ E.*).

These three banks consist of coarse sand and are very steep-to on their seaward side.

Chart 3543.

Tanjong Batu Lata lies about 3 miles northward of Tanjong Labohan; thence to Tanjong Paka, about 6 miles farther northward, there is a bay, the shores of which are fringed by a bank, with depths of less than 3 fathoms (5m5) over it. Sungei Paka discharges close southward of Tanjong Paka. Between Tanjong Paka and Tanjong Dungun, 7½ miles northward, there is another bay, at the northern end of which is Kuala Dungun. The shores of this bay are flat and sandy, and are covered with trees and scrub; a range of hills, from 500 to 600 feet (152m4 to 182m9) high, is situated about 2½ miles inland; a high range of hills, which is densely wooded and abrupt, extends 3 miles north-westward from Tanjong Paka; its highest summit, Bukit Bauk, 1,564 feet (476m7) high, is prominent.

The entrance points of the above-mentioned bays are rocky but there are depths of from 8 to 10 fathoms (14m6 to 18m3) from 2 to 3 miles offshore.

Chart 1397, plan of Kuala Dungun.

Sungei Dungun.—Lights.—Beacons.—Anchorage.—Sungei Dungun is entered close westward of Tanjong Dungun.

A light is exhibited, at an elevation of 226 feet (68m9), from a steel framework structure situated on the highest point of Tanjong Dungun.

Charts 1355, 2414, 2660a, 1263.

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Chart 1397, plan of Kuala Dungun.

Two beacons, surmounted by white triangles, which, in line, bear 337°, are situated on Tanjong Dungun, and serve to indicate the limits of the anchorage, but, as the line of these beacons does not run fair with the direction of the contours of the bottom here, their value is slight.

There is an open anchorage, in depths of from 6 to 10 fathoms (11m0 to 18m3), mud and sand, about 1½ miles offshore. Vessels anchoring closer inshore should do so in depths of not less than 4 fathoms (7m3), as the depths decrease rapidly within the 3-fathom (5m5) line off Kuala Dungun.

Leading beacons, surmounted by white triangles, are situated near the extremity of the western entrance point, and on the northern shore about half a mile north-westward ; in 1938, these beacons did not give a fair lead, and owing to their proximity to one another the transits are very insensitive. Navigation by boat is possible for several miles up the river, but local knowledge is required to avoid the many mudbanks.

Two leading lights are exhibited from the northern shore, about 1¾ cables north-eastward of the western entrance point, and, in 1951, were in line, bearing 315° ; these lights and the leading beacons are moored as necessary to meet the changes in the channel.

Fishing stakes extend from 3 to 4 miles offshore in the approach to Sungei Dungun. The entrance is obstructed by sandbanks which dry, extending about 2¾ cables from the western entrance point. In May, 1947, the least depth in the entrance was about 2 feet (0m6), but as the sandbanks in it are liable to frequent changes, both in position and depth, no directions can be given other than that after crossing the bar, which extends west-south-westward from Tanjong Dungun (*Lat. 4° 47′ N., Long. 103° 26′ E.*) to the coast, the greatest depths will be found close to the northern coast. Boat work is difficult over the outer part of the bar, and on the out-going stream a south-easterly wind causes a confused sea.

Mooring buoys.—There are numerous moorings for lighters about 3 cables eastward of the rest house and off Sura jetty (*see* below).

Kuala Dungun.—The village of Kuala Dungun, which is connected to the general telegraph and telephone systems, is situated mainly on the southern bank at the entrance to the river.

Sura jetty is situated about 1½ miles southward of the western entrance point ; it can only be used in calm weather. Lighters are available, but, during the greater part of the North-east monsoon season, working cargo in the anchorage is impracticable.

The Custom house is situated on the western entrance point.

Fruit and vegetables may be obtained, and fresh water is available.

There is steamer communication with Trengganu, and other ports on the coast.

The Government rest house, about three-quarters of a mile southward of the village and near the coast, is conspicuous.

Chart 3543.

Off-lying islands.—Light.—Dangers.—Pulau Tenggol, 907 feet (276m5) high and densely wooded, lies 14½ miles eastward of Tanjong Dungun. It has three main summits, the northern and centre of which are each divided into two peaks (*see* view facing page 67). On the western side is a small sandy cove in which are several sunken rocks ; the coast is otherwise steep and rocky, with considerable depths close off the points.

Charts 1355, 2414, 2660a, 1263.

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Chart 3543.

A light is exhibited, at an elevation of 203 feet (61^{m}9), from a white framework structure, 20 feet (6^{m}1) in height, situated on the eastern extremity of Pulau Tenggol.

Batu Tokong Daik, a bare rock, 34 feet (10^{m}4) high, lies about three-quarters of a mile southward of Pulau Tenggol. The channel between this rock and Pulau Tenggol appears to be clear of dangers, and has depths of 11 fathoms (20^{m}1) in the fairway.

Pulau Nyireh, which lies 2 miles north-north-westward of Pulau Tenggol, has two summits, the northern and higher having an elevation of 356 feet (108^{m}5). It is covered with trees, and the coast is steep. A rock, which dries 6 feet (1^{m}8), lies one cable north-westward, and a rock, with a least depth of 20 feet (6^{m}1) over it, lies nearly 3 cables eastward, of the northern point of the island. The channel between the island and Pulau Tenggol is about 1½ miles wide, with depths of about 26 fathoms (47^{m}5).

Pulau Tokong Burong, a bare rock, 84 feet (25^{m}6) high, lies one mile northward of Pulau Nyireh, and is steep-to. A small rock, 10 feet (3^{m}0) high, and another, 15 feet (4^{m}6) high, lie, respectively, 1¾ cables north-westward, and 8 cables east-south-eastward of Pulau Tokong Burong; they are both steep-to.

Current.—During the South-west monsoon, a current, with a rate of as much as 3 knots, sets in a north-north-westerly direction between Tanjong Dungun and Pulau Tenggol (*Lat. 4° 49′ N., Long. 103° 41′ E.*). In the vicinity of Pulau Tenggol and its off-lying islets the current attains a high rate close inshore and is most erratic both in direction and strength. In the passage between Pulau Tenggol and Pulau Nyireh there is usually an area of dead water in mid-channel northward of Pulau Tenggol. The current within one mile of the coast of the mainland is generally much weaker than in the offing.

A northerly or north-easterly current may be experienced between Tanjong Dungun and Pulau Tenggol during the South-west monsoon. On September 3rd and 8th, 1931, the S.Y. *Sea Belle II* experienced a north-easterly current of from 3 to 3½ knots in this position. During the North-east monsoon, the current between Tanjong Dungun and Pulau Tenggol is usually southerly.

In July, 1940, a northerly current, with a rate of 1¼ knots, was reported about 20 miles from the coast between Sungei Pahang and Pulau Tenggol.

Charts 1371, 2660a.

ANAMBAS EILANDEN. — General description. — Anambas eilanden lie in the southern portion of the China sea on the eastern side of the main route taken by vessels proceeding to Hong Kong. The westernmost island of the group, Damar (Domar) (*Lat. 2° 45′ N., Long. 105° 23′ E.*) lies about 53 miles east-north-eastward of Pulau Aur (page 67) which is situated on the western side of the same route.

The islands consist of two principal groups, the south-western and the north-eastern, and numerous detached islets. (*See* views A and B on chart 1371, and views facing this page.) These two groups are divided from one another by an imaginary line joining the islands Airabu, Buan, and Durai, which lie about 55 miles eastward and north-eastward of Damar (chart 3543).

Charts 1355, 2414, 1263.

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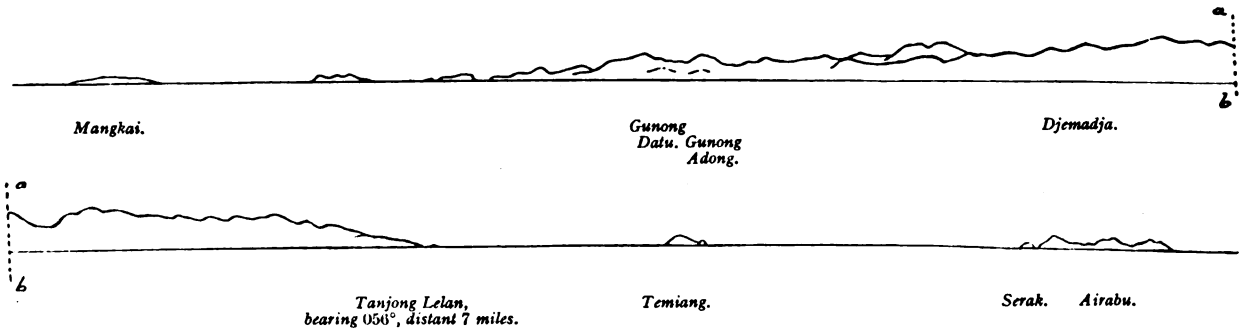
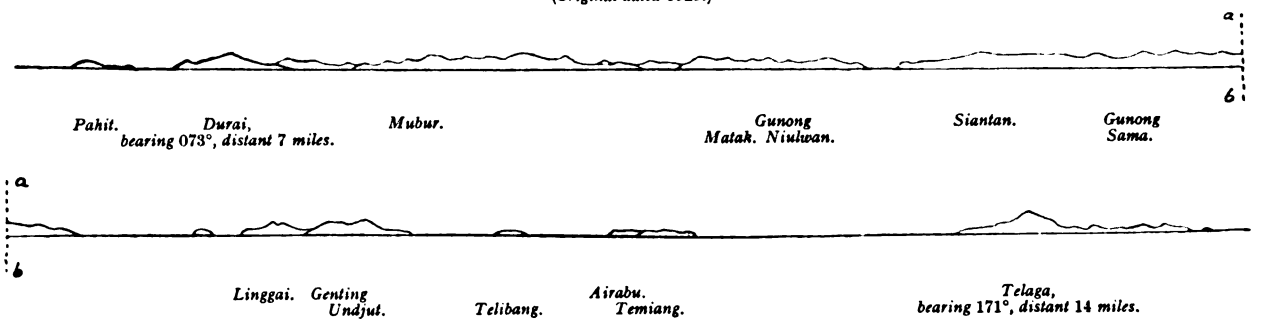
To face page 78.



View, in two parts, of Djemadja and other islands in the south-western group of the Anambas eilanden.

(*Original dated* 1929.)



View, in two parts, of the north-eastern group of the Anambas eilanden.

(*Original dated* 1929.)

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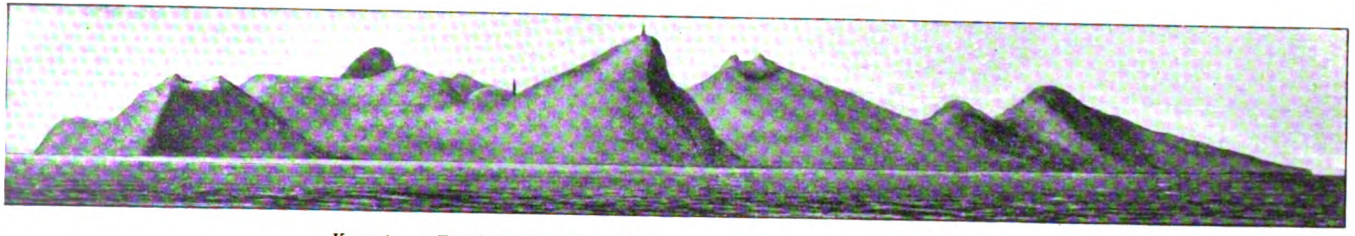
To face page 79.



Kramut. *Tree (conspicuous).* *Lt. Ho.*

Mangkai, bearing 069°, distant 8 miles.

(*Original dated* 1948.)

Mangkai, bearing 191°, distant 14 miles.

(*Original dated* 1916.)

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Charts 1371, 2660a.

The higher peaks of Anambas eilanden have elevations of from 1,200 to 1,800 feet (365^{m}8 to 548^{m}6) and have dense forests which reach to the summits. Many of the islands are inhabited; the abundance of coconut plantations is a noticeable feature of these islands.

The principal village is Terampah, situated on the northern coast of Siantan, the south-westernmost island of the north-eastern group.

The export of copra forms the staple trade of the islands; sago also is exported. The forests afford excellent timber. Besides agriculture and fishing the principal employment is the manufacture of sarongs and mats.

Fruit, goats and fowls can be obtained at the larger villages.

There is regular steamer communication with Singapore.

Caution.—Although the survey, in 1893, failed to discover any dangers in many of the passages between the islands, yet it was not of a sufficiently exhaustive character to justify vessels in attempting any such passages, and as a rule it is only the channels between the groups that should be made use of.

Floating islands, composed of grass, small trees, and other debris from the rivers, are sometimes met in the neighbourhood of Anambas eilanden; one floating island was reported, in 1911, to be about 50 feet (15^{m}2) long, and from 10 to 20 feet (3^{m}0 to 6^{m}1) high.

Tidal streams.—Observations, which are only available for the months of June to October, are as follows:—

The southerly stream began to run about 3 hours before high water at Trengganu, and the northerly stream commenced about 4 hours after high water at Trengganu, but these were subject to an uncertainty of as much as 2 or 3 hours either way. The southerly stream usually ran for 13 or 14 hours, and the northerly stream for 10 or 11 hours.

At springs the tidal streams had rates of from one to 2 knots; at neaps they were weak and irregular.

Chart 3543.

SOUTH-WESTERN GROUP. — Outlying islets. — Danger.—Damar (page 78) is a steep barren rock, 270 feet (82^{m}3) high, with depths of about 30 fathoms (54^{m}9) close round it. There is a small indentation both on its south-western and north-eastern sides where landing can be effected in fine weather. There was, in 1893, a little scanty vegetation near the top of the islet. The bold cliffs show white from the guano deposited on them.

Katoaka rock, a coral shoal, about 4 cables in extent, with a depth of 4¼ fathoms (7^{m}8) over it, lies about 19 miles south-south-eastward of Damar; less depths may exist on the shoal.

Chart 1371.

Tokong Malangbiru (*Lat. 2° 18′ N., Long. 105° 36′ E.*), the south-westernmost of Anambas eilanden, lies about 30 miles south-south-eastward of Damar. It is a white, flat-topped barren rock, 110 feet (33^{m}5) high, and with steep cliffs at its eastern end. The rock is steep-to all round, except close to the western extremity, where shallow water extends a short distance offshore.

Repong, an islet, about 17 miles east-north-eastward of Tokong Malangbiru, is covered with trees and has two peaks forming a high saddle, the eastern peak being the higher, having an elevation of 685 feet

Charts 2660a, 1263.

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Chart 1371.

(208m8). It is fringed by a narrow reef, the edge of which is steep.

Bawah is a group of uninhabited islets and rocks lying about 12½ miles north-eastward of Repong. The group rises from depths of over 30 fathoms (54m9) and is surrounded by a reef. The largest and northern islet has a wooded summit, 440 feet (134m1) high, and close northward of it there is a pyramidal-shaped rock, 220 feet (67m1) high. The southern islet is 410 feet (125m0) high. The edge of its reef extends about 3 cables south-eastward. Between the two principal islets there are a few low bushy islets and rocks lying on the edge of the reef which connects them.

Ritan, an island, which lies about 14 miles east-north-eastward of Bawah, together with the islands north-westward of it, is described on pages 85-89.

Djemadja.—Djemadja (Jemaja) is the principal and largest island of the south-western group of Anambas eilanden. Tanjong Lelan, the southern extremity, lies about 22 miles east-north-eastward of Damar (chart 3543). The island is densely wooded and mountainous, attaining an elevation of 1,530 feet (466m3) in Gunong Tudjuh (Tujuh), situated about 10 miles north-north-eastward of Tanjong Lelan; the peaks in the northern part of the island may for the most part be easily identified, but towards the southern end they become more uniform in outline.

Gunong Datu and Gunong Adong, 1,480 feet (451m1) and 1,420 feet (432m8) high, respectively, are two prominent peaks situated about 6 miles north-westward of Gunong Tudjuh. The former shows a remarkably sharp peak from nearly all directions; Gunong Adong (*Lat. 3° 01′ N., Long. 105° 43′ E.*) shows as a rounded hill from eastward or westward, but appears sharp from northward.

Western side of Djemadja. — Dangers. — Buoy. — Tanjong Dajang (Dayang) lies about 3¼ miles north-westward of Tanjong Lelan.

Daru, a wooded islet, 635 feet (193m6) high, lies about 3½ miles northward of Tanjong Dajang and about a quarter of a mile offshore.

Katukan, an islet, 110 feet (33m5) high, lies close westward of Daru, separated from it by a narrow boat channel.

Sibrong, an islet, joined to Djemadja by a reef, lies about 2½ miles northward of Daru. Sibrong has two prominent peaks, the southern of which is 580 feet (176m8) high. About half a mile southward of Sibrong and the same distance offshore is a reef, which dries.

Between Sibrong and Tanjong Djulan (Julan), about 2 miles north-westward, there is a bight with Tulai, an islet, 365 feet (111m2) high, lying about half a mile north-westward of the former. Tulai is fringed by a reef, which extends about 2 cables from its south-eastern extremity. A rock, about 4 feet (1m2) high, lies near the edge of the fringing reef about one cable south-westward of the islet. The important village of Letong, where there is a pier, is situated on the shore of the bight, about one mile eastward of Tulai; boats can lie alongside the pier, even at low water.

Berala, an islet, lies on the outer edge of a reef which extends about half a mile from the north-eastern shore of the bight, near Letong. A detached patch of coral, with a depth of 1½ fathoms (2m7) over it, is marked by a black mooring buoy, lying about one cable south-westward of it, about 3 cables southward of Berala.

Kumbur, an islet, on which there was, in 1936, a prominent tree,

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Chart 1371.

lies on a reef which extends about half a mile from the north-eastern side of Sibrong.

About 2 cables west-south-westward of the pier at Letong is the head of an indentation in the coastal reef; the northern and southern sides of this indentation are marked, unofficially, by beacons.

Ipan, an islet, 80 feet (24m4) high and covered with coconut trees, lies about a quarter of a mile westward of Tanjong Djulan; it is steep-to and a detached islet lies close off its southern extremity.

Between Tanjong Djulan (*Lat. 3° 01′ N., Long. 105° 41′ E.*) and the north-western extremity of Djemadja, about 3¼ miles north-north-eastward, there is a bight, the south-eastern shore of which is fringed by a reef. A reef, on which are some black rocks above water, extends nearly half a mile from the north-western extremity of Djemadja.

Off-lying dangers.—Margesson shoal, usually marked by tide-rips, lies about 5 miles westward of Tanjong Dajang. The shoal is composed of sand and coral, and consists of two portions; the northern has a depth of 6¼ fathoms (11m9) over it and the southern a depth of 5 fathoms (9m1).

Courier patch, with a depth of 6 fathoms (11m0) over it, lies about one mile south-westward of Tanjong Djulan.

Anchorages.—Communication.—Anchorage may be obtained north-eastward of Tulai. There is also anchorage for small vessels with local knowledge, off the pier at Letong; the best approach is southward of Tulai and between Kumbur and the coral patch which is marked by a black mooring buoy.

There is regular steamer communication between Letong and Singapore.

Islands and danger northward of Djemadja.—Light.—Mangkai, the north-westernmost of this group of islands, lies about 6 miles north-westward of Tanjong Djulan; it is 575 feet (175m3) high, almost of a uniform elevation throughout, and wooded. Mangkai kechil, 200 feet (61m0) high, lies close south-eastward of Mangkai. The coasts of both islands are fairly steep-to. *See* views facing page 79.

A light is exhibited, at an elevation of 617 feet (188m1), from a white iron framework tower, 82 feet (25m0) in height, on the western summit of Mangkai.

The light-structure is stated to be difficult to distinguish even at a distance of about 8 miles in good visibility; in 1948, a tree standing north-westward of the light-structure, apparently on the lower slope of the same summit, was very prominent.

When approaching Mangkai from northward during the North-east monsoon period, when, due to the variability of the rate of the southerly drift, a vessel may be ahead of her reckoning, it should be remembered that Mangkai light is frequently obscured by heavy rain squalls.

Kramut, an island, lies about 2 miles east-north-eastward of Mangkai, separated from it by a deep and clear passage.

Close north-eastward of Kramut is Mubur, an island, the two being joined by a mangrove swamp, through which there is a canoe passage.

A ridge of rounded hills lies on the northern side of Mubur, the highest of which has an elevation of 810 feet (246m9); on the southern side of the island is a bay, encumbered with foul ground. At the head of the bay is the village of Kramut, built on piles partly on Mubur and

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Chart 1371.

partly on Kramut, the two portions being connected by a foot-bridge; the zinc roofs of the houses in the village are plainly visible from seaward. The channel leading to the village is along the western side of the bay, and is marked by unofficial beacons so that vessels with local knowledge can anchor off it.

Datu, an islet, 350 feet (106m7) high, lies close off the south-eastern extremity of Mubur (*Lat. 3° 06′ N., Long. 105° 41′ E.*).

McCaulay patch is a small coral patch, with a depth of 5 fathoms (9m1) and possibly less over it, lying in the western approach to Impul passage (page 82), about one mile south-south-westward of Datu. The summit of Telaga (page 88), in line with the southern extremity of Impul, bearing 091°, leads northward of McCaulay patch; the south-eastern extremity of Impul in line with the outer of the black rocks extending from the north-western extremity of Djemadja, bearing 069°, leads southward; and Katukan, bearing 180°, and open eastward of Ipan, leads eastward.

Anak, an island, 640 feet (195m1) high, lies about half a mile north-eastward of Mubur. Some detached rocks above water lie close off the north-western extremity of Anak, and two islets lie, respectively, about 5 and 3½ cables north-westward and northward of the same point; the western islet is 205 feet (62m5) high and fringed by a reef, and the eastern islet is 180 feet (54m9) high.

Impul, an island, is situated south-eastward of Anak, separated from it by a channel 2 cables wide, with a depth of 7 fathoms (12m8) in the fairway. The sharp, wooded summit of Impul, which is 1,180 feet (359m7) high, lies near its centre, and is prominent.

Anchorage.—Communication.—Anchorage can be obtained by small vessels with local knowledge in the bay southward of Mubur, in a depth of 21 fathoms (38m4), sand and stones, with the south-western extremity of Datu bearing 119°, the south-eastern extremity of Mubur, 085°, and the south-eastern extremity of Kramut, 248°.

There is regular steamer communication between Kramut and Singapore.

Impul passage.—Dangers.—Impul passage is entered from westward between the north-western extremity of Djemadja and the south-western side of Impul, about one mile north-eastward.

On the northern side of Impul passage, a rock, with a depth of less than 6 feet (1m8) over it, lies close off the southern extremity of Impul. A bight is entered between the southern extremity and the south-eastern end of Impul, about one mile north-eastward. An islet, 130 feet (39m6) high and fringed by a reef, lies close off the north-eastern shore of the bight, and about 2 cables southward of the islet is a reef of rocks, just awash at high water.

On the southern side of Impul passage there is a bay between a point situated about 6 cables east-south-eastward of the north-western extremity of Djemadja and Tanjong Mingga, about 2¼ miles east-south-eastward. Depths of 5 fathoms (9m1) extend about a quarter of a mile from the western shore of the bay and some detached coral patches extend about the same distance offshore near the head of the bay. A shoal, with a depth of 4 fathoms (7m3) over it, lies about half a mile westward of Tanjong Mingga and about a quarter of a mile offshore.

Tanjong Mingga is a promontory, 350 feet (106m7) high, and appears

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Chart 1371.

from a distance as an island, being joined to Djemadja by a low sandy neck (*Lat. 3° 03′ N., Long. 105° 44′ E.*).

Impul passage is entered from eastward between Tanjong Mingga and the eastern extremity of Impul, about 2 miles northward.

Bunker patch, a coral head with a depth of 5 fathoms (9m1) over it, lies near the middle of the eastern approach to Impul passage at the extremity of a bank, with depths of less than 20 fathoms (36m6) over it, which extends over one mile south-eastward from Impul. The northern side of Mangkai, bearing about 280°, and open southward of Impul, leads southward of Bunker patch.

Tidal streams.—The tidal streams set eastward and westward through Impul passage at a rate of about 1½ knots at springs.

Anchorage.—The bay westward of Tanjong Mingga affords convenient anchorage, in a depth of 16 fathoms (29m3), sand, with Tanjong Mingga bearing 092°, distant one mile, out of the influence of the tidal streams. When anchoring, the 4-fathom (7m3) shoal westward of Tanjong Mingga, should be avoided. Vessels with local knowledge can anchor farther in, in a depth of about 12 fathoms (21m9).

North-eastern side of Djemadja.—Dangers.—Telok Mampo is entered between Tanjong Mingga and Ajam (Ayam), an islet, about 4½ miles south-eastward. Ajam, with two peaks, each 500 feet (152m4) high, is connected to Djemadja, southward, by a reef. A 2-fathom (3m7) patch lies close off the south-eastern shore of the bay, about three-quarters of a mile south-westward of Ajam.

Gumbong, an islet, 320 feet (97m5) high, and Hudang, an islet, 230 feet (70m1) high, lie on a reef situated in the north-western portion of Telok Mampo about one mile south-eastward of Tanjong Mingga and about half a mile offshore. Southward of Gumbong, foul ground extends about one mile off the western shore of the bay in places. At the south-western end of the bay there is a white sandy beach, at the eastern end of which lies Gunong Silvassi, 840 feet (256m0) high and prominent, situated about 4½ miles south-south-eastward of Tanjong Mingga. Gunong Puding, also prominent, and 700 feet (213m4) high, lies near the western end of the sandy beach, about 3 miles westward of Gunong Silvassi. Several villages are situated along this shore, Kampong Mampo, surrounded by coconut trees, being at its western end. Two patches, each with a depth of 3 fathoms (5m5) over it, lie about one mile north-westward and 1½ miles westward, respectively, of Gunong Silvassi, the latter being about three-quarters of a mile offshore. At the head of the bay there are some detached patches of reef within half a mile of the beach.

Tanjong Pinanang (*Lat. 2° 59′ N., Long. 105° 51′ E.*), the north-eastern extremity of Djemadja, is low and lies about 2½ miles east-south-eastward of Ajam. Pinanang, an islet, 270 feet (82m3) high and planted with coconut trees, lies about 1½ miles north-westward of Tanjong Pinanang.

Anchorage.—Anchorage may be obtained, in a depth of about 11 fathoms (20m1), near the middle of Telok Mampo about 2½ miles westward of Ajam.

South-eastern side of Djemadja.—Dangers.—The south-eastern side of Djemadja is rocky and steep. In some places there are beaches with coconut trees growing up the slopes of the hills behind them. The bays in the coast are open eastward and are not suitable for large

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Chart 1371.

vessels to enter. Between Tanjong Lelan (page 80) and Dajong (Dayong), an islet, about 3 miles north-eastward, the coast is indented. A flat, detached rock, 20 feet (6m1) high, lies about 3 cables south-eastward of Tanjong Lelan; a 2-fathom (3m7) patch lies about 2 miles north-eastward of the last-mentioned rock and about half a mile offshore. Dajong is 115 feet (35m0) high and is joined to Djemadja by a reef.

Telok Tiru is entered between Dajong and Tanjong Linang, about 4 miles north-eastward. The bay is divided into two parts; the southern part, extending about 3 miles inland, is encumbered with reefs and of no use for navigation; a 2-fathom (3m7) patch lies near the middle of the entrance, about three-quarters of a mile northward of Dajong.

Punisan, an islet, 400 feet (121m9) high, lies in the middle of the entrance to the northern portion of Telok Tiru, about 1¼ miles westward of Tanjong Linang. A detached reef lies about half a mile southward of Punisan. The area between this reef and the coast, north-westward, is encumbered with reefs, as also is the part of the bay north-westward of Punisan.

Telok Kuala is entered between Tanjong Linang and a point about 1½ miles northward. About three-quarters of a mile within the line joining the entrance points, the bay narrows and is obstructed by a rocky bar, with a depth of 3 fathoms (5m5) over it. Within this bar the depths increase to 6 fathoms (11m0) and then gradually decrease towards the head of the bay, but navigation is obstructed by detached coral patches. Sungei Selubung flows into the head of the bay making the water muddy, so that the coral patches are difficult to see.

Kampong Kuala is situated along the northern shore of the inner part of the bay.

Telok Djebung (Jebung) is entered between the northern entrance point of Telok Kuala and Tanjong Djebung (Jebung), a low and wooded point, about 3 miles north-eastward. The shore of the bay is fringed by a reef extending about half a mile offshore in places. Some detached reefs lie in the north-western part of the bay about half a mile offshore, and two islets lie on the coastal reef close southward of Tanjong Djebung.

Between Tanjong Djebung and Tanjong Pinanang the coast is indented; an islet, 145 feet (44m2) high and covered with coconut trees, lies about three-quarters of a mile southward of Tanjong Pinanang and about half a mile offshore; detached reefs extend southward from the islet as far as Tanjong Djebung (*Lat. 2° 58′ N., Long. 105° 51′ E.*).

Off-lying bank.—Westacott bank, with a depth of 7 fathoms (12m8) over it, lies about 4½ miles east-north-eastward of Tanjong Linang.

Anchorages.—Anchorage may be obtained in Telok Tiru, with the northern extremity of Dajong bearing 216°, distant one mile, in a depth of 14 fathoms (25m6), mud.

There is anchorage in the entrance of Telok Kuala with Tanjong Linang bearing 180°, distant about half a mile, and Kampong Kuala, 295°, in a depth of about 13 fathoms (23m8), sand. Small vessels with local knowledge can anchor farther in.

Telok Djebung affords good anchorage near the middle, about one

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Chart 1371.

mile offshore, in a depth of between 9 and 10 fathoms (16m5 and 18m3), sand.

Ritan group.—Dangers.—Ritan, 450 feet (137m2) high, and thickly wooded, is the largest of a group of islands lying 14½ miles east-north-eastward of Bawah (page 80). It is fringed by a reef extending about 2 cables from its south-eastern side; close off its western side is a conspicuous white rock, 40 feet (12m2) high. An islet, 280 feet (85m3) high, lies close eastward of the northern extremity of Ritan, joined to it by a reef.

Separated from these islands by a channel, one mile wide, is the north-easternmost islet of the group, 200 feet (61m0) high; a reef extends about 4 cables from its northern and western sides, the western extremity of the latter being marked by a flat rock, about 30 feet (9m1) high.

Brownrigg rock, a coral patch with a depth of 2 fathoms (3m7) over it, lies about one mile eastward of the 200-foot (61m0) islet.

The channel between the islets appeared to be clear, but has not been thoroughly examined (*see* "Caution" on page 79).

Tide-rips and overfalls occur southward of Ritan, which are apparently caused by the unevenness of the bottom and not by any off-lying danger.

There are generally tide-rips over Brownrigg rock (*Lat. 2° 38′ N., Long. 106° 19′ E.*).

Airabu group.—Dangers.—Airabu is the largest of a group of islands lying north-north-westward of Ritan, separated from it by a channel about 4 miles wide. A high wooded ridge, with several prominent peaks on it, traverses the island. The highest peak, near the north-western end, has an elevation of 1,595 feet (486m2), showing sharp from all directions; another prominent peak, 1,580 feet (481m6) high, is near the middle of the island and is flat-topped.

The northern side of Airabu is fringed by a reef. There is a bay between a point about 1½ miles southward of the north-western extremity and a point about 1½ miles farther southward; a reef, with an islet on it, extends about half a mile north-westward from the southern entrance point of the bay. The head of the bay is foul for about half a mile offshore.

Vessels with local knowledge can anchor in the middle of the bay, in depths of from 12 to 15 fathoms (21m9 to 27m4), mud, but it was reported, in 1946, that the best anchorage in bad weather is in the north-eastern corner of the bay, in a depth of about 20 fathoms (36m6), opposite two native huts on the beach.

Anchorage was also reported, in a depth of about 25 fathoms (45m7), in the small inlet westward of the summit; the only village on the island is situated here and fresh water can be obtained in barrels or cans.

The eastern side of Airabu is indented. A reef, awash, lies about 3¼ miles south-eastward of the north-eastern extremity of the island and about a quarter of a mile offshore; a 3-fathom (5m5) coral patch lies about one mile southward of the reef awash and about 1½ miles from the south-eastern extremity of the island.

Lintang, an island, 610 feet (185m9) high, with a sharp, wooded summit, lies close south-eastward of Airabu, separated from it by a boat channel. A group of six islets lies north-eastward and eastward

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Chart 1371.

of Lintang; the north-easternmost is 180 feet (54m9) high and is situated about 1½ miles from the island; the easternmost is 220 feet (67m1) high and lies about 6 cables southward of the north-easternmost islet.

White rock (*Lat. 2° 42′ N., Long. 106° 17′ E.*), 45 feet (13m7) high, with a flat top, lies about 8½ cables south-eastward of Lintang; foul ground extends about half a mile northward from White rock and a reef, awash, lies about half a mile west-south-westward of the rock.

Gembili, an island, 1,065 feet (324m6) high and densely wooded, with a sharp and prominent summit, lies westward of Airabu, separated from it by a channel nearly three-quarters of a mile wide. A reef, awash, lies about a quarter of a mile from the middle of the northern side of Gembili.

Islets and dangers westward and north-westward of Airabu.—A 6½-fathom (11m9) patch was reported, in 1950, to lie about 1¼ miles north-north-eastward of the north-western extremity of Gembili.

Serak, a wooded islet, 405 feet (123m4) high, lies about 10½ miles westward of the northern extremity of Airabu. It is fringed by a narrow reef, which is steep-to close to its edge, except on the northern and southern sides, where shallow water extends about one cable offshore.

Chart 2244.

Tokong Dahan, with a least depth of about one fathom (1m8) over it, on which the sea occasionally breaks, lies about 1¾ miles west-north-westward of the northern extremity of Airabu.

Tokong, an islet, 100 feet (30m5) high, steep-to, and covered with trees, lies about 2 miles north-north-westward of Airabu.

Charts 2244, 1371.

Temiang group.—Dangers.—Genting, a wooded islet, 315 feet (96m0) high, lies about 3½ miles westward of Tokong; it has two rounded peaks on its eastern end and its north-western end is low, with a reef extending about 3 cables from it.

Chart 1371.

Mentaju (Mentayu), an islet, 325 feet (99m1) high and wooded, lies about 1½ miles north-north-westward of Genting. A reef extends about half a mile from its north-eastern side; on the northern edge of the reef is a rock, 6 feet (1m8) high.

Charts 2244, 1371.

Temiang, the largest of this group of islands lying north-westward of Airabu, is separated from Mentaju by a deep and clear channel about 2 miles wide in its narrowest part. The western extremity of Temiang lies about 3 miles north-north-eastward of Mentaju.

Temiang is low in the centre rising to a broad, flat-topped hill at either end; the western and higher hill has an elevation of 860 feet (262m1) and is densely wooded. There is a village on the north-eastern side of the island.

Chart 2244.

A reef, with an islet near its outer extremity, extends about 3 cables from the south-eastern extremity of Temiang.

Mangkudu, an islet, 100 feet (30m5) high, and flat, lies about 8 cables south-eastward of Temiang; a reef, part of which is above water, lies midway between them. Mangkudu is fringed by a reef; a button-shaped islet, 85 feet (25m9) high, lies on the south-eastern extremity of the reef, about 4 cables from Mangkudu, with another islet on the same

Charts 2660a, 1263.

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Chart 2244.

reef between them. A detached reef lies about a quarter of a mile south-south-westward of the 85-foot (25m9) islet.

Telaga Tjina (China), a flat islet, 130 feet (39m6) high, similar in appearance to Mangkudu, lies about half a mile south-westward of that islet, with foul ground between them; this islet is fringed by a reef extending from one to 2½ cables offshore.

Mangkait, an islet, 145 feet (44m2) high, with a tongue of reef projecting about a quarter of a mile westward from it, lies about one mile westward of Telaga Tjina and about three-quarters of a mile off the southern side of Temiang.

North-eastward of Temiang are four islands, separated from it by a deep and clear channel about 1¼ miles wide in its narrowest part.

Udjung (Ujung) (*Lat. 2° 57′ N., Long. 106° 11′ E.*), the easternmost island of this group, lies about 2½ miles north-eastward of the south-eastern extremity of Temiang; it is 505 feet (153m9) high and wooded. A reef, on the outer end of which is a rock above water, extends about 2½ cables south-eastward from the south-eastern extremity of Udjung; reefs also extend about the same distance from the north-eastern and northern extremities of the island.

Lubang Tamban, an island, 525 feet (160m0) high, lies about half a mile north-westward of Udjung with a narrow channel between. Its eastern side is fringed by a reef and some detached patches of reef lie close off its western side. Udjung and Lubang Tamban are both inhabited.

Telibang (Telebang), 610 feet (185m9) high and wooded near its northern end, lies about one mile north-westward of Lubang Tamban. Dikar, an islet, 350 feet (106m7) high, situated about 4 cables westward of Telibang, lies on a reef which extends about 4 cables westward, and in patches about three-quarters of a mile northward, leaving a narrow boat channel between it and Telibang; some rocks above water lie near the western extremity of the reef. A detached 3-fathom (5m5) patch lies about one mile northward of Dikar, and a 5-fathom (9m1) coral patch lies about 6½ cables north-westward of the same island.

Islands and dangers north-eastward of Temiang group.— Buan, an island, 250 feet (76m2) high and wooded, lies about 3¾ miles north-eastward of Udjung. A detached reef, parts of which are above water, lies close off its western side. Its eastern side is fringed by a reef which extends from one to 3½ cables offshore, and from its southern extremity a reef, on which there are two islets, the northern being 14 feet (4m3) high, extends about 3½ cables southward.

Pascoe klip, with a depth of 3 fathoms (5m5) over it and steep-to, lies about 2 miles eastward of the northern extremity of Buan.

Talojan (Taloyan), a wooded islet, 285 feet (86m9) high, lies about 2½ miles north-westward of Buan and is separated from the north-eastern group of Anambas eilanden by a channel about 3 miles wide.

Bennet klip, with a depth of 2 fathoms (3m7) over it, lies nearly one mile eastward of the southern extremity of Talojan, and a patch, with a depth of 5 fathoms (9m1) over it, and probably less, lies about 1½ miles north-eastward of the same point; these two dangers lie on the eastern end of a bank, with depths of less than 20 fathoms (36m6) over it, which lies off the northern side of Talojan, and extends almost continuously, for a distance of 4½ miles north-westward from that islet.

Barnes bank, with a depth of 7 fathoms (12m8) over it, sand and

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Chart 2244.

coral, is situated at the north-western end of this bank; there is a 10-fathom (18m3) patch on the same bank, about three-quarters of a mile south-eastward of Barnes bank.

About half a mile south-westward of Talojan (*Lat. 3° 03′ N., Long. 106° 13′ E.*) is another bank, with depths of less than 20 fathoms (36m6) over it, near the eastern end of which is a depth of 7 fathoms (12m8), situated about three-quarters of a mile west-south-westward of the southern extremity of Talojan.

Chart 1371.

Telaga group.—Dangers.—The Telaga group of islands lies about 9½ miles north-westward of Temiang.

Telaga is the largest and easternmost island of this group, its southern extremity lying about 8 miles east-north-eastward of Tanjong Pinanang (page 83). A prominent conical peak, 1,740 feet (530m3) high, is situated near the northern end, and a high ridge of hills extends the whole length of the island, which is densely wooded. Foul ground extends about 3 cables from the southern extremity of the island, and a reef, near the extremity of which is a rocky islet, extends about 6 cables from its south-western extremity. Both the eastern and western sides of the island are fringed by a reef extending a short distance offshore.

Telaga is inhabited, the villages being principally on the western side.

Buton, an island, 360 feet (109m7) high at its northern end, lies about half a mile westward of the southern end of Telaga. The island is covered with coconut trees; a reef, on which are some rocks above water, extends about a quarter of a mile from its southern extremity, and another reef extends nearly three-quarters of a mile from its north-western end. Dinkor, a rock, above water, lies on the last-mentioned reef, about half a mile offshore.

Telaga kechil, an islet with a sharp summit, 585 feet (178m3) high, lies about 6½ cables off the north-western end of Telaga. A reef extends about a quarter of a mile from its southern end, and a detached reef lies about a quarter of a mile farther southward; there is a narrow passage between it and the reef extending northward from Buton, leading to an indifferent anchorage, available for vessels with local knowledge, in which there is a depth of about 17 fathoms (31m1), westward of Telaga.

The channel between Buton and Telaga leads to the same anchorage but, as stated on page 79, it is not prudent to use the channels between the islets of any group.

Lima, 475 feet (144m8) high, the northernmost of this group of islands, lies close northward of Telaga kechil, and is joined to it by a reef.

Midai, an islet, lies midway between Lima and the north-western side of Telaga, from which it is separated by a channel about a quarter of a mile wide, with a depth of 13 fathoms (23m8) in the fairway. Reefs extend about a quarter of a mile westward from Midai, and about 5½ cables from its southern extremity.

Pasu (*Lat. 3° 06′ N., Long. 105° 58′ E.*), an islet, 250 feet (76m2) high, lies close northward of Midai and is joined to it by a sandy neck, which dries.

Tokong Blinau, a rock, 6 feet (1m8) high, lies about 2½ miles west-

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Chart 1371.

ward of the south-western extremity of Telaga kechil. Foul ground extends about half a mile from the rock except on its western side. *Charts 2244, 1371.*

Genting group.—Dangers.—Genting Undjut (Unyut), the westernmost of a group of islands, is situated about 6 miles north-eastward of Telaga. A ridge of wooded hills extends along the middle of Genting Undjut, culminating in a summit, 950 feet (289^{m}6) high, near the southern end. A reef, on which is a rock about 5 feet (1^{m}5) high, extends about 3 cables from the northern extremity of the island, and there is a bay on its western side, in the middle of which there is a depth of 15 fathoms (27^{m}4).

Linggai, an island, lies about one mile eastward of the southern end of Genting Undjut. A ridge of wooded hills rises to the summit, 950 feet (289^{m}6) high, near the southern end of the island.

Chart 1371.

Semisak, an islet, 450 feet (137^{m}2) high, and wooded, lies close westward of the northern extremity of Linggai, connected to it by a reef. Musuh, an islet, 395 feet (120^{m}4) high, lies close southward of Linggai and is connected to the south-western extremity of the latter by a reef.

Chart 2244.

Nawan, an islet, 270 feet (82^{m}3) high and wooded, lies about one mile eastward of Linggai, and is the easternmost of the group. A bank, with depths of less than 5 fathoms (9^{m}1) over it, extends about 3 cables from the western side of Nawan.

Batu Karang Singka, awash, lies on a dangerous coral patch, about 1½ miles north-north-eastward of Nawan, and about 3 miles off the western coast of Siantan; depths of less than 5 fathoms (9^{m}1) extend about 3 cables northward from the rock and about 4 cables southward.

Chart 1371.

Islets northward of Telaga group.—Durai, an islet, wooded and uninhabited, lies about 10½ miles northward of Genting Undjut, and about 7 miles westward of Mubur (page 90), in the north-eastern group of Anambas eilanden. It has two sharp peaks, 500 feet (152^{m}4) high. Some rocks, with a depth of less than 6 feet (1^{m}8) over them, lie close off the north-western end of the islet.

Batu Mamong, 3 feet (0^{m}9) high, lies about half a mile south-westward of Durai.

Tokong Nanas (*Lat. 3° 20′ N., Long. 105° 57′ E.*), 70 feet (21^{m}3) high, lies about 5½ miles westward of Durai. A narrow coral bank, with a least depth of 6 fathoms (11^{m}0) over it, and steep-to, extends nearly one mile west-south-westward from Tokong Nanas.

Pahit, an islet, which lies about 6½ miles north-eastward of Durai, is described on page 95.

Chart 2244.

NORTH-EASTERN GROUP. — General description. — The north-eastern group of Anambas eilanden consists of three large islands and an archipelago extending about 10 miles south-eastward from Badjau, the south-easternmost of the large islands. In the channels between the islands of the archipelago many dangers exist, and vessels should not use them without local knowledge.

Siantan, about 23 miles north-eastward of Djemadja (page 80),

Charts 3543, 2660a, 1263.

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Chart 2244.

is the most important island. It is mountainous throughout and densely wooded. Gunong Sama, the summit, 1,855 feet (565m4) high, situated about 4½ miles south-south-eastward of Tanjong Pedas, the north-western extremity of the island, is prominent. Another peak, 1,595 feet (486m2) high, about 2½ miles north-eastward of the summit, is prominent by its forming a shoulder that falls steeply northward, but the general outline of the mountain ridges in the broader parts of the island is smooth and rounded, making the peaks not easy to identify. There are numerous mountain streams in Siantan.

Matak, an island, lies north-eastward of Siantan, separated by Selat Peninting, about three-quarters of a mile wide in its narrowest part. Gunong Niulwan, the summit of Matak, is 1,365 feet (416m0) high, and lies at the southern end of the island; it is very prominent. The middle of the island is low.

Mubur, the north-westernmost of the three large islands of the group, lies westward of Matak, separated from it by Selat Matak, about a quarter of a mile wide in its narrowest part. The summit of Mubur, 1,330 feet (405m4) high and densely wooded, is situated in the south-eastern part of the island; viewed from northward or southward the summit appears as a fairly sharp peak, but from westward as a high ridge.

The sides of the three islands mentioned above, together with their off-lying islands and dangers, are described under the channels between them and the islands off-lying them; their western sides, with the islands lying south-eastward of Siantan, form the north-eastern side of the channel separating the two principal groups of the Anambas eilanden.

Islands and dangers south-eastward of Siantan.—Nunsa, the south-easternmost of the north-eastern group of Anambas eilanden, lies about 10 miles eastward of Buan (page 87). It is 195 feet (59m4) high and wooded; foul ground extends nearly 2 cables southward from the island. A small bank, with a least depth of 13 fathoms (23m8) over it, lies about 1½ miles southward of Nunsa.

Akar, 525 feet (160m0) high, is the largest and the easternmost of a group of six islands and islets lying north-north-westward of Nunsa, separated from it by a channel about 1½ miles wide, which is deep and clear of danger but across which there are frequently tide-rips.

Egeria klip, a coral head, with a depth of 2 fathoms (3m7) over it, lies in the north-eastern approach to the above channel, about 2½ miles east-north-eastward of the southern extremity of Akar. There is a patch, with a depth of 3½ fathoms (6m4) over it, about half a mile westward of Egeria klip.

Tjatu (Chatu) (*Lat. 3° 01′ N., Long. 106° 24′ E.*), an islet, 190 feet (57m9) high, lies about 1½ cables off the south-western side of Akar.

Telok Bakau, an island, 225 feet (68m6) high, lies about 3 cables westward of Akar. A reef extends 6 cables from the northern end of Telok Bakau, and on the western edge of this reef is Baba, an islet, 135 feet (41m1) high.

Bate, an island, 270 feet (82m3) high, lies midway between Baba and the north-western extremity of Akar. Reefs extend about 3 cables from the southern end of Bate; Semut, 240 feet (73m2) high, the westernmost islet of the group, lies about a quarter of a mile south-westward of Baba.

Charts 1371, 2660a, 1263.

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Chart 2244.

A bank, with depths of less than 20 fathoms (36m6) over it, extends about 1¼ miles northward from Semut; Batu Bini, which dries 3 feet (0m9), and Batu Laki, 3 feet (0m9) high, about 4 cables southward, are situated near the extremity of this bank, on the eastern side of the fairway of the channel which separates the group of islands, described above, from Memperuk. This channel leads into Thetis vaarwater, which is described on page 100.

Tanjong Belantan, the south-eastern extremity of Memperuk, lies about 1¼ miles north-westward of Semut. Gunong Mundjan (Munjan), the summit of Memperuk, about one mile north-north-westward of Tanjong Belantan, is 760 feet (231m6) high and prominent from all directions. The eastern side of Memperuk is fringed by a reef.

Batu Rakit, consisting of rocks, from 2 to 6 feet (0m6 to 1m8) high, lies about 1¼ miles northward of Tanjong Belantan, about one cable offshore; a rock, awash, lies close south-eastward of Batu Rakit, and northward of it, for a distance of about half a mile, rocks, both above water and awash, extend about 2 cables offshore.

Howard klip, with a depth of 13 feet (4m0) over it, lies about 8 cables east-south-eastward of the northern extremity of Memperuk. For clearing marks, *see* page 101.

Abang, an islet, 345 feet (105m2) high, lies close westward of the southern end of Memperuk. The eastern side of Abang is fringed by a reef and off its western side there is a reef, at the extremity of which is a rock, 15 feet (4m6) high, lying about one cable offshore, with other rocks above water close offshore on the same reef.

Tenggeran, an islet, 135 feet (41m1) high, lies about one mile north-westward of Abang. A chain of islands extends about 3¼ miles north-eastward from Tenggeran, between which and the western side of Memperuk there is a channel which leads into Thetis vaarwater (page 100); this channel is only one cable wide in its narrowest part and is not recommended. The chain of islands forming the western side of this channel is described on pages 93-94.

Walsh bank, composed of coral, with a depth of 6 fathoms (11m0) over it, and depths of over 20 fathoms (36m6) at a distance of about 3 cables around, lies about 2 miles west-south-westward of Tenggeran; Pascoe klip, about 2 miles farther south-south-westward, is described on page 87.

Selat Tandjung (Tanjong) Suka, entered from south-westward between Tenggeran and Tanjong Suka, the southern extremity of Badjau, about 1¼ miles north-north-westward, is described on page 93.

Badjau (Bajau), an island, has two prominent peaks; the western one, Gunong Simangi, 785 feet (239m3) high, lies about 2¼ miles north-north-westward of Tanjong Suka, and the other peak, 780 feet (237m7) high, about one mile north-eastward of Gunong Simangi.

Some islets, one of which is 70 feet (21m3) high, lie close southward of Tanjong Suka (*Lat. 3° 05′ N., Long. 106° 18′ E.*).

Between Tanjong Suka and Tanjong Dumang, on the south-western side of Badjau, about 1¼ miles north-westward, there is a bay, the sides of which are fringed by reefs. Near the middle of the bay are some detached reefs, the outer of which lies about 4 cables north-eastward of Tanjong Dumang.

Selat Berawa, described on page 93, is entered from south-eastward

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Chart 2244.

between Tanjong Dumang and a point on the south-eastern end of Siantan about 4½ cables south-westward.

Anchorage.—Anchorage may be obtained in the entrance of the bay on the south-western side of Badjau, in a depth of 15 fathoms (27m4), sand.

Tidal streams.—In the vicinity of Nunsa (page 90), the tidal streams set south-westward and north-eastward at a rate of about one knot.

Southern side of Siantan.—Tanjong Kretang, the southern extremity of Siantan, lies about 2 miles west-south-westward of Tanjong Suka; it may be identified by a prominent hill, 210 feet (64m0) high, on its extremity; about 8 cables northward is Gunong Peta, a sharp prominent peak, 770 feet (234m7) high, with a valley between them.

Berhala, an islet, 140 feet (42m7) high and covered with trees, lies about half a mile eastward of Tanjong Kretang; a reef extends about 1½ cables north-westward from Berhala.

Batu Tikus, 12 feet (3m7) high, lies on a reef extending nearly two cables south-westward from Tanjong Kretang; other rocks, one of which is black with a flat top, 19 feet (5m8) high, extend about 1½ cables southward from the same point.

Bennet klip and the 5-fathom (9m1) patch lying north-north-eastward of it, situated about 3 miles south-westward of Tanjong Kretang, are described on page 87.

A bay, exposed during the South-west monsoon, is entered between Tanjong Kretang and Tanjong Maluat, about 1½ miles north-westward. Reefs extend from one to 2 cables from the sides of the bay and 3 cables from its head.

Sui, a flat-topped and wooded islet, 300 feet (91m4) high, lies about 2 cables south-westward of the peninsula of which Tanjong Maluat is its southern extremity; a bank, with a least depth of 12 fathoms (21m9) over it, lies about three-quarters of a mile southward of Sui.

Telok Ajer (Ayer) Bini is entered between Tanjong Maluat and Tanjong Baik, which is low, about 1¾ miles westward. On the western side of the bay, Telok Luing, in which there are some houses, is entered between Tanjong Baik and a point about 6 cables north-eastward. Some white rocks, 10 feet (3m0) high, lie close southward of the last mentioned point and a detached reef lies about one cable farther southward. A patch, with a depth of 1¾ fathoms (3m2) over it, marked by discoloration, lies about three-quarters of a mile north-eastward of the white rocks and about a quarter of a mile offshore. On the eastern side of Telok Ajer Bini, a detached reef lies close offshore and parallel with the coast, about half a mile northward of Sui.

Tanjong Mandi Angin lies on the south-western side of Siantan, about 2 miles north-westward of Tanjong Baik (*Lat. 3° 06′ N., Long. 106° 14′ E.*). Telok Rambutan is entered between Tanjong Mandi Angin and a point about three-quarters of a mile south-eastward. This bay is exposed southward; on its western side, a reef extends about 2 cables offshore.

Barnes bank, situated about 3¾ miles south-westward of Tanjong Mandi Angin, is described on page 87.

Anchorage.—Good anchorage may be obtained in Telok Ajer Bini, about half a mile northward of Sui, in a depth of about 16 fathoms (29m3), mud.

Charts 1371, 2660a, 1263.

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Chart 2244.

Selat Tandjung Suka.—Selat Tandjung (Tanjong) Suka, or Favorite channel, leads into Thetis vaarwater, which is described on page 100; the south-western entrance of the former is described on page 91. On the eastern side of the strait is the chain of islands extending 3¼ miles north-eastward from Tenggaran (page 91). The western side of the strait is formed by the south-eastern side of Badjau.

Tina, an islet, lies about 3 cables north-north-eastward of Tenggaran. Pemutus, an island, 260 feet (79m2) high in its northern part, lies with Tanjong Bulu Kara, its southern extremity, about 3 cables eastward of the northern extremity of Tina. The island is fringed by a reef which extends about 2 cables from its southern and northern extremities.

Uruk Uruk, an island, 195 feet (59m4) high, lies with its southern extremity about three-quarters of a mile eastward of the northern extremity of Pemutus; an islet, 30 feet (9m1) high, lies about one cable southward of the western extremity of the former, joined to it by a reef. The eastern side of Uruk Uruk is fringed by a reef extending about one cable offshore, and a reef, on which is Batu Hitam, an island, 200 feet (61m0) high, extends 8½ cables southward from the southern extremity; a rock, 20 feet (6m1) high, lies on this reef about 1½ cables south-south-westward of Batu Hitam.

Pengelat, an island, 250 feet (76m2) high, lies about a quarter of a mile eastward of Uruk Uruk. It is fringed by a reef, and depths of less than 6 fathoms (11m0) extend a short distance from its western side.

On the western side of Selat Tandjung Suka, there are two detached reefs, one about one mile north-eastward of Tanjong Suka and nearly 2 cables offshore, and the other, which dries 3 feet (0m9) and generally shows clearly, about half a mile farther north-eastward and about 3 cables offshore. With the exception of these reefs the channel is clear of danger, with depths of over 20 fathoms (36m6) in the fairway. Selat Tandjung Suka is entered from north-eastward between Pengelat and a point on Badjau about one mile north-westward.

Chabrol banken, which lie in the north-eastern approach to Selat Tandjung Suka, are described on page 100.

Tidal streams.—The tidal streams set straight through Selat Tandjung Suka, in a north-easterly and south-westerly direction, at a rate of from 1½ to 2 knots. With a southerly wind and south-going stream, tide-rips and overfalls occur in the southern part of the strait.

Anchorage.—Directions.—There is anchorage in Selat Tandjung Suka about 1½ cables north-westward of Pengelat with Gunong Mundjan (Munjan), the summit of Memperuk (page 91), in line with the south-eastern extremity of Uruk Uruk, bearing 183°, in a depth of about 18 fathoms (32m9), sand.

The western side of Getah (page 101), bearing 030°, just open south-eastward of the eastern extremity of Badjau, leads close north-westward of Walsh bank (*Lat. 3° 02′ N., Long. 106° 18′ E.*) and through the southern part of the strait, south-eastward of the reefs on the western side of Selat Tandjung Suka.

Channels on the eastern side of Siantan.—Selat Berawa separates Badjau from Siantan; its south-eastern entrance is described on page 91. A short distance within this entrance the channel is reduced to a width of little more than one cable between the reefs which extend

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Chart 2244.

north-eastward from Siantan, on one side, and south-westward from Badjau, on the other.

Selat Semanggi, a continuation of Selat Berawa, is entered about 1½ miles north-westward of the south-eastern entrance of the latter. On the western side of Selat Semanggi the coast of Siantan is fringed by a reef, detached portions of which extend about a quarter of a mile offshore. On the eastern side, the fringing reef follows the shore more closely. Near the middle of the strait, about 2 cables offshore and about 8 cables north-north-westward of Gunong Simangi (page 91), is a patch with a depth of 5½ fathoms (10^{m}1) over it, sand and coral; about one mile northward of this patch, reefs extend about 4 cables from the eastern side of Siantan. Near its north-eastern end Selat Semanggi leads into Selat Taburik, which separates the northern end of Badjau from Masabang, an island, about 4 cables north-westward.

Selat Taburik leads into Thetis vaarwater (page 100).

Masabang is 435 feet (132^{m}6) high; a reef extends about 1½ cables from its southern extremity.

Selat Batu Belah, in which the channel is only about 2 cables wide between the reefs on either side, is entered between the southern extremity of Masabang and an islet, 210 feet (64^{m}0) high, lying about 1½ cables from the eastern side of Siantan, about 4 cables south-westward. Reefs extend about 3 cables northward from the last-mentioned islet and nearly 2 cables from the south-western side of Masabang. On the western side of Selat Batu Belah reefs extend over 3 cables from the north-eastern coast of Siantan. On its eastern side, a narrow channel is entered between Masabang and Batu Belah, an island, 385 feet (117^{m}3) high, about half a mile north-westward. At its northern end, Selat Batu Belah leads into Selat Peninting (page 95), between the north-western extremity of Batu Belah and Djangkat (Jangkat), an islet about 6 cables south-westward.

Djangkat (Jangkat), 105 feet (32^{m}0) high, lies on the coastal reef which extends about half a mile from the north-eastern side of Siantan; about a quarter of a mile eastward of Djangkat is a detached reef which lies on the western side of the northern entrance to Selat Batu Belah.

The channel between Masabang and Batu Belah is obstructed at its eastern end, by Dekit, an islet, 140 feet (42^{m}7) high, lying on the reefs which extend nearly one mile from the south-eastern side of Batu Belah, and by other reefs which extend over one cable northward from Masabang.

Rium (*Lat. 3° 12′ N., Long. 106° 19′ E.*), an islet, 170 feet (51^{m}8) high, lies about 2 cables eastward of the northern end of Batu Belah, to which it appears to be connected by reefs.

The dangers eastward and northward of Rium, which lie on the western side of Thetis vaarwater, are described on pages 101-103.

Tidal streams.—The tidal streams set through Selat Taburik in a south-westerly and north-easterly direction at a rate of about one knot. The tidal streams run somewhat strongly through Selat Batu Belah in a south-easterly and north-westerly direction.

Directions.—Directions for Selat Batu Belah are given on page 97.

Western sides of Siantan and Mubur.—Between Tanjong Mandi Angin (page 92) and Tanjong Pedas, the north-western extremity of Siantan, about 7 miles northward, the western side of Siantan can be

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Chart 2244.

approached to the distance of about half a mile ; about 1¼ miles southward of Tanjong Pedas, a coral bank, with a least depth of 12 fathoms (21m9) over it, extends about 6 cables offshore.

Nawan and Batu Karang Singka, about 4 miles westward of Tanjong Mandi Angin, are described on page 89.

Selat Peninting, entered from north-westward between Tanjong Pedas and Tanjong Jang (Yang), the south-western extremity of Matak, about 2½ miles north-eastward, is described below. Tanjong Pedas is a steep point, and rises to a hill, 610 feet (185m9) high, about half a mile south-south-eastward. Tanjong Jang consists of black cliffs.

Selat Matak (page 98) is entered from south-westward between Tanjong Jang and the southern extremity of Mantas, an island about 2¼ miles north-westward.

Mantas, on the western side of Telok Ajer Bandong (page 98), is 520 feet (158m5) high and wooded ; its north-western end is separated from the southern side of Mubur (page 90) by an opening, named Mandi Lang, a few yards wide.

Rinji (Rinyi), an islet, wooded and 165 feet (50m3) high, with black cliffs, 50 feet (15m2) high, on its southern side, lies about one mile north-westward of Mantas and about 3 cables off the south-western side of Mubur. A reef extends north-eastward from Rinji nearly as far as a reef extending from the south-western side of Mubur in this vicinity.

Tanjong Sapan, the western extremity of Mubur, lies about 1½ miles northward of Rinji.

Pedjantai (Pejantai), an islet, 215 feet (65m5) high with a flat top, lies off the north-western side of Mubur, about one mile northward of Tanjong Sapan. Shallow water with some sunken rocks off the eastern side, extends about one cable from the islet, except at its southern end, which is steep-to.

Between Tanjong Sapan and a point about 3 miles north-eastward there is a bight in the north-western side of Mubur. From the last mentioned point as far as the northern extremity of the island, about 2 miles north-eastward, the north-western coast of Mubur is fringed by a reef extending about 1½ cables offshore.

Noran (*Lat. 3° 24′ N., Long. 106° 14′ E.*), an islet, 160 feet (48m8) high, lies close off the northern extremity of Mubur.

Outlying islets.—Pahit, the north-westernmost islet of the north-eastern group of Anambas eilanden, lies about 4½ miles westward of the northern extremity of Mubur ; it has a flat, wooded summit, 700 feet (213m4) high. Rocks, with depths of less than 6 feet (1m8) over them, lie close off its northern side and its south-eastern side is fringed by a reef extending in places about a quarter of a mile offshore. The channel between Pahit and Pedjantai is about 2½ miles wide.

Tokong Belajar (Belayar), the northernmost of Anambas eilanden, lies about 4 miles north-eastward of Noran. It is a remarkable light green bare rock like a pillar, 68 feet (20m7) high ; a reef extends about a quarter of a mile north-eastward from the rock and about one cable southward from it. The edges of the reef are steep.

Selat Peninting.—Dangers.—Selat Peninting separates Siantan from Matak ; its north-western entrance is described above.

Charts 1371, 2660a, 1263.

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Chart 2244.

On the southern side of the strait, Terampah baai (page 97), is entered between Tanjong Pedas and Tanjong Momang, about 1¾ miles eastward.

A rock, one foot (0m3) high, with a depth of 3 fathoms (5m5) close south-eastward, lies about 2 cables off the north-eastern side of Tanjong Pedas.

Between Tanjong Momang and Tanjong Kangor, about 2 miles south-eastward, the north-eastern coast of Siantan is indented, about midway, by a bay half a mile wide between the entrance points. The shores of the bay are fringed by reefs, extending about 2 cables from the western shore and about one cable from the eastern shore. An islet lies on the coastal reef close off the eastern side of the bay. A reef, part of which dries 4 feet (1m2), extends about a quarter of a mile north-eastward from Tanjong Kangor. Tanjong Tuman, off which broken reefs extend about a quarter of a mile, lies about 3 cables south-eastward of Tanjong Kangor.

On the north-eastern side of Selat Peninting, between Tanjong Jang and a black, cliffy point, about 1½ miles south-eastward, the south-western coast of Matak is fringed by rocks, with a depth of less than 6 feet (1m8) over them, close offshore. Between the last mentioned point and a point about 1½ miles south-eastward, the coast of Matak is clear of danger. The southern end of Matak is indented; reefs and foul ground extend about one mile from it, leaving a navigable channel, only 2 cables wide, between the foul ground and the reefs extending from Tanjong Tuman; the position of these reefs can best be seen on the chart.

The coast of Siantan between Tanjong Tuman and Djangkat, 2 miles south-eastward, is fringed by a reef extending 4 cables offshore in places.

The south-eastern end of Selat Peninting is obstructed by islets and reefs.

Pau (*Lat. 3° 12′ N., Long. 106′ 18′ E.*), an islet, 160 feet (48m8) high, lies on a reef which extends about 6½ cables northward from the north-eastern extremity of Batu Belah (page 94).

Telok Pau, an island, 550 feet (167m6) high, lies about half a mile northward of Pau. The island is fringed by a reef extending about 2 cables from its southern end. The channel between Pau and Telok Pau is obstructed by detached reefs. Detached reefs also extend 5½ cables eastward from Pau, and north-eastward as far as Tingarat (page 102). A boat with local knowledge can find a passage between these reefs.

Between Telok Pau and the south-eastern extremity of Matak, about half a mile westward, Selat Peninting turns northward and runs along the south-eastern side of Matak. Reefs extend about 1½ cables from the western side of Telok Pau and about 2 cables from the eastern side of Matak, with detached reefs between.

Telok Niulwan is entered about one mile northward of the south-eastern extremity of Matak; the entrance is obstructed by a detached reef. This inlet is shallow and divides the southern part of Matak into two high and wooded peninsulas; there are many villages on the shores of the inlet.

Air Asuk, a wooded island, 470 feet (143m3) high, lies off the south-eastern side of Matak, its southern end being situated about 2 cables

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Chart 2244.

northward of Telok Pau. Reefs extend westward from Air Asuk and eastward from Matak, leaving a narrow channel between them.

Lidi, an island, 220 feet (67m1) high at its northern end, lies about 2 cables north-eastward of Air Asuk.

Selat Peninting enters Selat Tebang (page 106) between the northern extremity of Lidi and the coast of Matak, about half a mile westward; the entrance is obstructed by reefs.

Directions.—In case of necessity, the following directions may be useful for proceeding through Selat Peninting and Selat Batu Belah (page 94):—A vessel entering Selat Peninting from westward should keep in mid-channel until about half a mile northward of Tanjong Kangor. When Tanjong Jang is in line with the black cliffy point about 1½ miles south-eastward of it, bearing about 318°, she should alter course and keep on that alignment astern, until the northern extremity of Batu Belah is in line with the northern extremity of Lujong (page 101), bearing 101°. She should then proceed on that alignment until the western extremities of Batu Belah and Masabang are in line, bearing 159°, when she should keep on that alignment until abreast of the detached reef which lies eastward of Djangkat, when course should be altered to clear the reef extending from the western side of Batu Belah. Thence she should keep in the fairway of the channel between the reefs, and, when southward of Masabang, either steer north-eastward through Selat Taburik or south-westward into Selat Semanggi.

Terampah baai.—Lights.—Beacons.—The entrance to Terampah baai is described on page 96.

There is a small bay entered between Tanjong Pedas and Tanjong Baruk, about three-quarters of a mile south-eastward. Another small bay is entered on the eastern side of Terampah baai between Tanjong Momang (*Lat. 3° 14′ N., Long. 106° 14′ E.*) and Tanjong Angkak, about half a mile south-westward. Reede Terampah is entered between Tanjong Angkak and Tanjong Baruk. Both sides of this part of the bay are fringed by reefs extending about 1½ cables offshore; at its head there is a sandy beach.

A light is exhibited, at an elevation of 158 feet (48m2), from a white stone structure, 7 feet (2m1) in height, situated on a hill, near the head of the bay, about 1¼ miles south-eastward of Tanjong Baruk.

A light is exhibited from the end of the pier.

A light, privately maintained, is occasionally exhibited in front of the north-westernmost house of the Malay village, about 4½ cables north-westward of the light on the hill.

A white iron beacon, surmounted by a ball, marks the edge of the reef extending from the western shore, about 4½ cables south-eastward of Tanjong Baruk, and a black beacon, surmounted by a cone, marks the edge of the reef extending from the eastern shore about 3½ cables southward of Tanjong Angkak; the latter beacon is difficult to distinguish.

Anchorage.—Directions.—There is anchorage in Terampah baai with the light on the end of the pier bearing about 147°, and the light in front of the north-westernmost house in the Malay village, bearing about 243°, in a depth of 15 fathoms (27m4), sand and mud. During the North-east monsoon, vessels should anchor farther out and landing is then usually impracticable.

Charts 1371, 2660a, 1263.

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A vessel approaching Terampah baai from westward, after passing the one-foot (0m3) high rock, which lies about 3½ cables eastward of Tanjong Pedas, should steer for the light-structure, situated on the hill southward of Terampah village, on a southerly bearing, passing midway between the entrance points.

Terampah.—Terampah, the principal village in Anambas eilanden, with an estimated population of from 2,000 to 3,000, stands at the head of Terampah baai; it is built on either side of a creek, which dries; the Chinese quarter is on the eastern side of the creek and the Malay quarter is on the western side. There is a pier, with a depth of 4 feet (1m2) alongside, with a black disc on its head, in front of the Government offices; a few yards northward of this pier there is a patch of coral. There is a pier, 312 feet (95m1) long, half a cable westward of the Government pier, alongside which a vessel with a draught up to 13 feet (4m0) can berth. There is a wooden pier near the Chinese quarter.

Bread and pork may be obtained.

There is regular steamer communication with Singapore.

Selat Matak.—The south-western entrance of Selat Matak is described on page 95. Between Tanjong Jang and a point about 2½ miles northward, the west coast of Matak is indented; northward of the last mentioned point the coast is fringed by reef extending a short distance offshore.

Telok Ajer (Ayer) Bandong is entered between the southern extremity of Mantas and the south-eastern extremity of Mubur, about one mile north-eastward. The shores of Telok Ajer Bandong are fringed with a reef, which, except at the head, extends only a short distance offshore. There are a few inhabitants on the shores of the bay.

Between the south-eastern extremity of Mubur and the eastern extremity, 3¼ miles north-north-eastward, the western shore of Selat Matak is fringed by a narrow reef which is steep-to. Telok Matak is entered from southward between the eastern extremity of Mubur and a point on Matak about 3 cables eastward.

Tidal streams.—The tidal streams set in a northerly and southerly direction through Selat Matak at a rate of from one to 2 knots in the narrow part.

Anchorage.—Telok Ajer Bandong affords safe anchorage to vessels with local knowledge about 6 cables from its head, in a depth of 17 fathoms (31m1), mud.

Telok Matak. — Islets and dangers. — Tokong Belajer (*Lat. 3° 27′ N., Long. 106° 16′ E.*), which lies about 3 miles northward of the entrance, is described on page 95.

Tanjong Pandan, the eastern entrance point of the bay, is the northern extremity of Semut, a wooded island, 710 feet (216m4) high, lying close northward of Matak, from which it is separated by Selat Onas, which latter is about one cable wide, and is encumbered with rocks.

In the north-western part of Telok Matak are several islets and rocks. Tenggiling, an islet, 450 feet (137m2) high, lies about 6 cables southward of Noran (page 95), and about a quarter of a mile off the north-eastern coast of Mubur. Foul ground extends about one cable from the north-western side of Tenggiling and from its south-eastern side

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Chart 2244.

a reef extends about the same distance; Dut, an islet, 90 feet (27m4) high, lies on the eastern edge of this reef.

Utjing (Uching), an islet, 240 feet (73m2) high, lies about three-quarters of a mile east-north-eastward of Tenggiling; a bank, with depths of less than 3 fathoms (5m5) over it, on which there are some rocks above water, extends about 3 cables westward from Utjing, and Labong, an islet, 45 feet (13m7) high, lies near the outer end of the bank; a rock, with a depth of less than 6 feet (1m8) over it, lies about 2 cables southward of Labong, and a patch of coral, with a depth of 9 fathoms (16m5) and possibly less over it, lies about half a mile northward of Utjing.

Langor, an islet, 70 feet (21m3) high, with reefs extending about one cable from its north-eastern and south-western sides, lies about 3 cables southward of Tenggiling.

The north-eastern coast of Mubur is indented between the western entrance point of Telok Matak and the northern entrance of Selat Matak, about 3¼ miles south-south-eastward.

On the eastern side of Telok Matak, Baru, an islet, 250 feet (76m2) high, lies about 1¼ miles south-south-westward of the western extremity of Semut and about a quarter of a mile off the north-western side of Matak; Telok Ulu Mangar, which is narrow, is entered about half a mile southward of Baru. Reefs extend offshore from both sides of the inlet. Pemutus, a village, is situated on the south-western side of Telok Ulu Mangar, about 1¾ miles southward of Baru. A peninsula extends about three-quarters of a mile northward from the coast in the vicinity of Pemutus. The western side of the peninsula is fringed by a reef, and reefs extend about half a mile from its northern end. Selat Matak is entered from northward about three-quarters of a mile westward of Pemutus.

Anchorage.—Directions.—Anchorage may be obtained in any part of Telok Matak, in depths of from 21 to 30 fathoms (38m4 to 54m9). Vessels entering from northward should pass eastward of Utjing.

North-eastern side of Matak.—Off-lying islands and dangers.—Selat Onas is entered from eastward between the south-eastern extremity of Semut, and a point on the north-eastern side of Matak, about a quarter of a mile southward.

A shoal, with a depth of 3 fathoms (5m5) over it, lies about half a mile north-north-eastward of the south-eastern extremity of Semut, and about 4 cables offshore.

Batu Garam is an island lying with Tanjong Kepinis, its northern extremity, about 4 miles east-north-eastward of Tanjong Pandan. Tanjong Kepinis slopes steeply from a hill, 490 feet (149m4) high, and is steep-to. A ridge of hills, from 600 to 770 feet (182m9 to 234m7) high, extends along the middle of Batu Garam nearly its whole length. The island is densely wooded and there are several villages along the coast.

The area between Batu Garam and the north-eastern end of Matak is occupied by islets and reefs, and there is no navigable channel between them.

Piatjuk (Piachuk) (*Lat. 3° 22′ N., Long. 106° 19′ E.*), an islet, 160 feet (48m8) high, with a reef extending about one cable from its northern end, lies midway between Matak and Batu Garam, about 6½ cables westward of the middle part of the latter.

Charts 1371, 2660a, 1263.

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Kelang, an islet, 140 feet (42m7) high, lies about a quarter of a mile south-eastward of Piatjuk.

Batu Tumpik, an islet, 280 feet (85m3) high, lies about 1¼ cables southward of Piatjuk, and Seberang, an islet, 275 feet (83m8) high, lies about 6 cables south-westward of Batu Tumpik, and close off the north-eastern side of Matak.

The eastern side of Batu Garam and Tanjong Muning, its southern extremity, together with the islands extending southward of it, are described under Thetis vaarwater.

Anchorage.—There is anchorage between Piatjuk and the eastern side of the northern end of Matak, with the northern extremity of the former bearing 070°, distant 3½ cables, in a depth of 14 fathoms (25m6), coral.

Thetis vaarwater.—General description.—Thetis vaarwater lies eastward of Batu Garam, Matak, and Badjau, and runs between the islands of the archipelago lying eastward of those islands. It can be entered from south-westward through any of the channels between the islands lying south-eastward of Siantan, which have already been described. Its south-eastern entrance is through the channels between the islands which lie between Nunsa (page 90) and Selai, an island, about 12½ miles north-north-eastward. Its northern entrance lies between Tanjong Kepinis and Pendjalin (Penjalin) besar, an island, about 5½ miles east-south-eastward. Thetis vaarwater could probably be navigated from aloft with the sun in a favourable position, but there is apparently little to be gained by using it. The route outside the islands appears to be preferable.

Southern part of western channel.—Islands and dangers.—The channel between Nunsa and Akar, together with Egeria klip, which lies in the south-eastern entrance to Thetis vaarwater, are described on page 90.

A bank, with depths of less than 3 fathoms (5m5) over it, extends about one cable from the northern side of Akar.

The islands and dangers extending north-westward of Akar, as far as Batu Bini, are described on page 90.

The channel leading into Thetis vaarwater between Batu Bini (*Lat. 3° 04′ N., Long. 106° 22′ E.*) and Memperuk, together with Howard klip, which lies in its northern approach, is described on page 91.

Selat Tandjung Suka, which leads into Thetis vaarwater between Pengelat and Badjau, is described on page 93.

Mentalak, an island, 300 feet (91m4) high at its southern end, is cultivated with coconut trees in places, and lies about 2½ miles eastward of Pengelat.

Pedjaul (Pejaul), an island, 760 feet (231m6) high, lies 8 cables north-north-westward of Mentalak. Selat Telok Dalam, between Pedjaul and Pundjung (Punjung), is described on page 103. Two islets lie on the reef which fringes the north-western side of Pedjaul; the north-eastern islet is 180 feet (54m9) high, and the south-western is 150 feet (45m7). A rock, 3 feet (0m9) high, lies about 2 cables south-westward of the latter and about 2¾ cables off the coast of Pedjaul.

Chabrol banken, two patches, half a mile apart in a north-westerly direction, lie in the south-western part of Thetis vaarwater midway between Badjau and Pedjaul. The south-eastern patch, with a depth of 3½ fathoms (6m4) over it, lies about 1½ miles north-eastward of the

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Chart 2244.

north-western entrance point of Selat Tandjung Suka ; the other patch has a depth of 4½ fathoms (8m2) over it.

The south-western extremities of Mangkian Pandak (*see* below) and Getah, in line bearing 342°, lead close eastward of Chabrol banken and also 8½ cables eastward of Howard klip.

Between Tanjong Lanting, the north-eastern extremity of Badjau, situated about 1¾ miles northward of the north-western entrance point of Selat Tandjung Suka, the coast, except for two rocks, awash, close offshore near its southern end, is clear of danger. A reef, with a depth of 6 fathoms (11m0) close off its outer end, extends about 2½ cables northward from Tanjong Lanting. Between this point and the northern extremity of Badjau, about 1¾ miles north-westward, the coast is indented by two bays, separated from one another by a peninsula which extends about one mile from the coast. Both bays are encumbered with reefs ; a reef extends about three-quarters of a mile north-north-westward from the northern extremity of the peninsula which separates them, and another reef extends about 2 cables from the northern extremity of the island.

Selat Taburik, which enters Thetis vaarwater between Badjau and Masabang, is described on page 94.

A reef extends nearly half a mile from the north-eastern side of Masabang and eastward of Dekit.

A reef extends 3½ cables south-eastward from Rium, and a detached reef lies in the northern approach to Selat Taburik, about 3 cables farther eastward.

Getah, an island, 290 feet (88m4) high and wooded, lies about one mile north-westward of Pedjaul.

Lujong (Luyong), an island, lies close northward of Getah, being joined by a reef extending from the south-eastern end of the former. Lujong is wooded and has two well defined peaks, separated by a narrow strip of low land ; the northern peak is 375 feet (114m3) high, and the southern peak is 330 feet (100m6) high. A shoal, with a depth of 2½ fathoms (4m1) over it, and depths of from 3½ to 7 fathoms (6m4 to 12m8) around, lies about 4 cables westward of the middle of the island. The eastern side of Lujong is fringed by a reef extending a short distance offshore ; a detached reef lies close outside this fringing reef near the southern end of the island. A rock, 10 feet (3m0) high, lies close off the north-western end of Lujong.

An islet (*Lat. 3° 11′ N., Long. 106° 21′ E.*), 160 feet (48m8) high and wooded, lies about three-quarters of a mile westward of the northern extremity of Lujong ; a spit, with a depth of 3 fathoms (5m5) over it, extends about one cable northward and southward from this islet. Another islet, 80 feet (24m4) high and wooded, lies about one mile west-north-westward of the northern extremity of Lujong ; a reef extends about 2 cables southward from the islet, and a bank, with depths of 3 fathoms (5m5) over it, extends a short distance from its eastern and northern sides.

Mangkian Pandak, an islet, 160 feet (48m8) high, lies about 1½ cables north-westward of the last mentioned islet, and about 2¼ miles eastward of Rium. Mangkian Pandak has a sandy spit at its southern end and a reef extends about 2 cables from its western side.

A coral bank, with a least depth of 3 fathoms (5m5) over it, lies about 6 cables north-eastward of Mangkian Pandak, and another coral

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Chart 2244.

bank, with a least depth of 3½ fathoms (6m4) over it, lies about one mile north-north-eastward of the same island.

Northern part of western channel.—Islands and dangers.—Temuang kechil, 70 feet (21m3) high, and Temuang besar, 100 feet (30m5) high, about 2 cables northward, lie on a reef on the western side of the channel, with its southern extremity about half a mile eastward of Rium. A detached reef, with a depth of 4½ fathoms (8m2) over it, close north-eastward, lies about 4 cables south-eastward of Temuang kechil.

Tingarat, an islet, 65 feet (19m8) high, lies on a reef about one mile northward of Temuang besar. The reef extends about 3½ cables northward and 4 cables southward from Tingarat.

A reef, with a sand cay, which dries 5 feet (1m5), on the middle of the western side, lies about 8½ cables eastward of Tingarat.

Thetis reef, composed of coral, lies about 2 miles north-eastward of Tingarat. A 4½-fathom (8m2) patch lies about 3½ cables south-south-westward of the reef, and a bank, with a depth of 3 fathoms (5m5) near its southern end and 5 fathoms (9m1) near its northern end, lies from 3 to 9 cables northward of the reef. A 4-fathom (7m3) patch lies about three-quarters of a mile westward of the northern extremity of the reef.

Hale patch, with a depth of 3½ fathoms (6m4) over it, coral, lies nearly 2 miles north-eastward of Thetis reef.

Tobing, an islet, 145 feet (44m2) high, lies about half a mile northward of Tingarat. A reef, at the extremity of which are some detached patches, extends about 2 miles northward from Tobing; on this reef are, from southward, Mapit, 95 feet (29m0) high, Sampa, 135 feet (41m1), an unnamed islet, 90 feet (27m4), and Tingo Ilot, 90 feet (27m4) high, at the northern end.

Koran (*Lat. 3° 15′ N., Long. 106° 18′ E.*), an island, 270 feet (82m3) high, lies north-westward of Tobing, between the latter and the southern end of Air Asuk (page 96).

Lidi lies with its southern extremity about 4 cables north-westward of Tingo Ilot; detached reefs lie within about half a mile eastward of Lidi and a reef extends about 6 cables from its north-eastern end.

Selat Tebang (page 106) is entered from southward between Lidi and Mantang kechil, about 1½ miles east-north-eastward; in the approach to the entrance, a coral patch, with a depth of 7 fathoms (12m8) over it and possibly less depth, lies about 6½ cables southward of Mantang kechil. The north-eastern extremity of Matak, bearing 350°, and open westward of Tanjong Muning (*see* below), leads westward of the coral patch and the foul ground extending south-westward from Mantang kechil.

Mantang kechil, 200 feet (61m0) high, is the southernmost of a chain of islets lying on a reef extending about 1¾ miles north-north-westward. Mantang besar, 235 feet (71m6) high, lies close north-westward of Mantang kechil; Pidi, 230 feet (70m1) high, lies close northward of Mantang besar; and Piogus, 175 feet (53m3) high, is the northernmost islet. Foul ground extends about 3 cables south-westward from Mantang kechil and a reef extends about 1½ cables northward from Pidi and eastward from Piogus.

The above islets are cultivated with coconut trees and are inhabited.

Tanjong Muning, the southern extremity of Batu Garam (page 99),

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Chart 2244.

is separated from Piogus by a passage about a quarter of a mile wide, with a depth of 5 fathoms (9m1) in the fairway.

Hooper patches are two detached shoals lying on the western side of Thetis vaarwater. The northern patch, composed of sand and coral, with a least depth of 5 fathoms (9m1) at its southern end, lies about 1¼ miles eastward of Tanjong Muning; the southern patch, with a depth of 6 fathoms (11m0) over it, lies about one mile from the northern patch, and about the same distance eastward of Pidi.

The south-eastern end of Batu Garam is indented by a bay, the entrance to which is foul.

Snul, an islet, 300 feet (91m4) high and wooded, lies about 3½ miles north-north-eastward of Tanjong Muning, and is separated from the eastern side of Batu Garam by a channel about 2 cables wide.

Eastern side of Thetis vaarwater.—Islands and dangers.— Pempang is the south-easternmost of a group of islands lying at the south-eastern end of Thetis vaarwater, about 5½ miles north-eastward of Akar (page 90); it is 460 feet (140m2) high, wooded and inhabited.

Pundjung lies north-westward of Pempang, separated from it by a channel about half a mile wide; it is the highest island eastward of Siantan and has two prominent peaks, 6½ cables apart connected by a high saddle; the eastern peak is 1,140 feet (347m5) high. The northern and southern sides of the island are indented. An islet, 190 feet (57m9) high, lies about 3½ cables south-westward of the south-eastern extremity of Pundjung; a reef extends a short distance from the north-western end of this islet, between which and the coast of Pundjung there is a depth of 7 fathoms (12m8). Another islet, 95 feet (29m0) high, lies about 1¼ cables off the south-western side of Pundjung.

Selat Telok Dalam is entered from southward between the south-western extremity of Pundjung and the eastern extremity of Pedjaul (page 100). The eastern shore of the strait is fringed by a reef extending a short distance from the north-western side of Pundjung. On the western side of the strait there is an indentation in the reef which joins Pedjaul with Pengending (*Lat. 3° 09′ N., Long. 106° 24′ E.*), an island, 815 feet (248m4) high, lying close eastward of the northern end of the former. A rock, 6 feet (1m8) high, lies close off the north-eastern extremity of Pengending on a reef which extends about 3 cables from the same point. Selat Telok Dalam is entered from northward between the last mentioned reef and the northern extremity of Pundjung, about a quarter of a mile south-eastward.

An islet, 115 feet (35m0) high, from which a reef extends a short distance, lies about 6½ cables northward of the northern extremity of Pedjaul.

An islet, 160 feet (48m8) high, lies close off the north-western extremity of Pengending; a rock, awash, lies about 1½ cables northward of this islet with a rock, 4 feet (1m2) high, between them.

Telok Risan is the largest of a group of islands lying northward of Pundjung. Its summit, 570 feet (173m7) high and wooded, is situated about 2¾ miles north-north-eastward of the summit of Pundjung. An islet, 60 feet (18m3) high, lies close off its eastern side, about 6½ cables south-eastward of the summit; its south-eastern side is indented by a bay from the shores of which a reef extends as far as the line joining the entrance points; an islet, 150 feet (45m7) high, lies in the southern part of this bay, close offshore.

Charts 1371, 2660a, 1263.

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Chart 2244.

Temuruk, an islet, 280 feet (85m3) high, lies close southward of Telok Risan. A sandy isthmus extends south-westward from Temuruk ending in a promontory, 80 feet (24m4) high, about 4 cables from the islet. Between this promontory and Pundjung there is a deep passage, 4 cables wide. Reefs and a bank, with depths of less than 3 fathoms (5m5) over it, extend half a mile north-westward from Temuruk. Nibung, an islet, 135 feet (41m1) high, lies about 1½ cables south-eastward of Temuruk.

The western side of Telok Risan is indented by a bay, outside the entrance to which, about half a mile offshore, are some detached reefs, and a 2½-fathom (4m6) patch lies about half a mile farther westward.

A detached reef, awash, lies about 2 miles westward of the summit of Telok Risan.

Esperance reef, with a sandbank which dries 6 feet (1m8) near its southern end, lies about one mile north-eastward of the northern extremity of Lujong. A bank, with a depth of 8 fathoms (14m6) over it, lies about half a mile north-eastward of Esperance reef; a sand and coral shoal, with a depth of 4¼ fathoms (7m8) over it, lies about one mile north-north-eastward of the reef; a similar shoal, with a depth of 5½ fathoms (9m6) over it, lies about three-quarters of a mile farther north-north-eastward. As there may be less depths over these shoals, they should be avoided.

The south-eastern extremity of Getah in line with the northern extremity of Uruk Uruk (page 93), bearing 209°, so that the northern entrance of Selat Tandjung Suka cannot be seen, leads between Esperance reef and the detached reef lying 1½ miles westward of Telok Risan, and also eastward of the shoals lying north-north-eastward of Esperance reef.

Selai (*Lat. 3° 12′ N., Long. 106° 29′ E.*), the easternmost of Anambas eilanden, is separated from Telok Risan by a channel nearly 2 miles wide. The summit of Selai, 530 feet (161m5) high, shows sharp from northward or southward, broad-topped from other directions. The northern, eastern, and southern sides of the island are indented, the bays on the eastern and southern sides being foul and rocky; a reef extends about 1½ cables from the head of the bay on the northern side and a spit extends a short distance from each entrance point. Penilan, an island, 305 feet (93m0) high, lies north-westward of Selai, separated by a narrow boat channel. Its western side is fringed by a reef extending a short distance offshore. Kudok, an islet, 85 feet (25m9) high, lies about 1¼ miles westward of Penilan. Busung, a wooded islet, 335 feet (102m1) high, lies about 6 cables north-westward of Penilan. A reef extends about 3 cables south-eastward from the islet; on the extremity of this reef is an islet 110 feet (33m5) high, with a remarkable boulder, 50 feet (15m2) high, on the same reef, about 2 cables northward. A detached patch, awash, lies about one cable off the southern edge of the reef.

The channel between Busung and Sagu Dampar, about 7 cables westward, is obstructed in its southern entrance by a rock, awash, with depths of from 4 to 7 fathoms (7m3 to 12m8) close around it, lying about half a mile westward of the southern extremity of Busung. With this exception, the channel is clear.

Sagu Dampar is 500 feet (152m4) high. A reef extends about 1½ cables south-westward from its south-eastern extremity. Two

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Chart 2244.

detached reefs lie about 3 cables off its south-western side, the southern of which dries 4 feet (1m2); these two detached reefs are the northernmost of a chain of reefs extending about 2½ miles northward from Telok Risan. The area between Telok Risan and Sagu Dampar is unsafe.

Sama, an islet, 225 feet (68m6) high, lies on the north-eastern side of a reef which extends about 8 cables northward from Sagu Dampar; on the northern extremity of this reef is an islet, 40 feet (12m2) high. Tjina (China), an islet, lies on the same reef nearly midway between Sagu Dampar and Sama.

Thetis vaarwater can be entered from north-eastward by a deep and clear channel between Sagu Dampar and Manda Riouw Laut, an island, about 2 miles north-westward.

Manda Riouw (Riau) Laut is 335 feet (102m1) high; Ipil, an islet, lies on a reef which extends about 2 cables from its southern end. A rock, 4 feet (1m2) high, lies close off the south-western extremity of Manda Riouw Laut, from which a reef extends about 2 cables south-south-westward.

Mangkian, 140 feet (42m7) high, and cultivated with coconut trees, lies about one mile south-westward of Manda Riouw Laut. A reef extends from one to 2 cables from all sides of Mangkian, except on the eastern side where it skirts the island closely. The passage between Manda Riouw Laut and Mangkian is clear of danger.

A coral patch, with a depth of 2½ fathoms (4m6) over it, lies about 6 cables south-south-westward of Mangkian.

For Hale patch, about 1½ miles north-westward of Mangkian, *see* page 102.

Manda Riouw (Riau) Darat (*Lat. 3° 18′ N., Long. 106° 24′ E.*) lies close north-westward of the northern end of Manda Riouw Laut; its summit, 465 feet (141m7) high, is prominent. The area between the two islands is encumbered with reef. Close off the southern extremity of Manda Riouw Darat is a square rock, 12 feet (3m7) high, and close off the western side of the island are two boulders, one 30 feet (9m1) high and the other, half a mile northward, 40 feet (12m2) high.

Menjali (Menyali), an islet 200 feet (61m0) high and wooded, lies about 3 cables north-westward of Manda Riouw Darat.

Tokong Gurun, 30 feet (9m1) high, closely surrounded by depths of 4 fathoms (7m3), lies about 4½ cables north-north-westward of Menjali.

Njemuk (Nyemuk), an islet, 180 feet (54m9) high, lies about 8 cables northward of Tokong Gurun. Njemuk is separated from the Pendjalin group, lying north-eastward, by a channel about 3 miles wide.

Pendjalin (Penjalin) besar, with a rounded summit, 430 feet (131m1) high, is the largest of a group of islands situated about 5 miles eastward of Batu Garam (page 99). Thetis vaarwater is entered from northward between this group and Batu Garam.

There is a bay on the western side of Pendjalin besar, and rocks extend close off its south-western and north-western extremities.

Setudju (Setuju), 215 feet (65m5) high, the north-easternmost of Anambas eilanden, lies at the extremity of a reef which extends about 3 cables eastward from the northern end of Pendjalin besar. An islet, 125 feet (38m1) high, lies on the same reef about a quarter of a mile southward of Setudju.

Pendjalin (Penjalin) kechil, an island, 320 feet (97m5) high, lies

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Chart 2244.

close off the south-eastern end of Pendjalin besar. A reef extends a short distance from its south-western side and about half a mile from its south-eastern side. Tanjong Lamun is the southern extremity of Pendjalin kechil.

Pasu, an islet with a conical summit, 200 feet (61m0) high, lies close north-eastward of Pendjalin kechil, with islets, one of which is 70 feet (21m3) high, and rocks between them; a rock, 60 feet (18m3) high, lies about one cable north-westward of Pasu.

Alarm bank, lying about 8½ cables east-north-eastward of Pasu, is composed of sand and coral, with depths of from 4¾ to 5½ fathoms (8m7 to 10m1) and possibly less over it. A small patch, with a depth of 6 fathoms (11m0) over it, lies about half a mile north-eastward of Alarm bank with greater depths between; a bank, with a depth of 15 fathoms (27m4) over it and greater depths around, is situated about half a mile farther eastward. Heavy overfalls and tide-rips mark these banks, and they should be avoided.

Anchorages in Thetis vaarwater.—There is anchorage, sheltered from southerly winds, northward of Pedjaul (page 100), with the islet, lying close northward of Pengending, bearing 095°, and the islet, lying northward of Pedjaul, bearing 034°, distant 3 cables, in a depth of 13 fathoms (23m8), sand and coral.

Anchorage, protected from southerly winds, may be obtained in the middle of the bay on the northern side of Selai (page 104), in a depth of 13 fathoms (23m8).

Temporary anchorage, protected from northerly winds, may be obtained on the south-eastern side of Penilan (page 104), but the anchorage has not been thoroughly examined.

Temporary anchorage may be obtained eastward of Pendjalin besar and northward of Pendjalin kechil, with the south-eastern extremity of the former (*Lat. 3° 23′ N., Long. 106° 27′ E.*) bearing 233°, distant 4 cables, in a depth of 15 fathoms (27m4), sand and coral.

Tidal streams in Thetis vaarwater.—The tidal streams set northward and southward through Thetis vaarwater, at a rate of from three-quarters of a knot to 1¼ knots.

Selat Tebang.—The southern entrance of Selat Tebang is described on page 102. In the south-western part of the strait, Selat Peninting (page 95) is entered from northward.

On the western side of Selat Tebang, reefs extend about 6 cables from the eastern side of Matak.

Beliba, an island, 305 feet (93m0) high and wooded, lies near the middle of the strait, about half a mile westward of Piogus (page 102). Reefs extend about 3 cables south-south-eastward from Beliba.

Reefs extend about 3 cables from the western sides of the chain of islets lying northward of the eastern entrance point of Selat Tebang. The passage between Piogus and Tanjong Muning, leading into Thetis vaarwater, is described on page 102.

The northern part of Selat Tebang is obstructed by islands and reefs, and ends in a narrow gutter between Batu Garam and Matak. The islands in this portion of the strait are described on pages 99-100.

Anchorage.—Directions.—There is good anchorage in Selat Tebang, nearly three-quarters of a mile westward of Mantang besar, in a depth of 13 fathoms (23m8), mud.

To reach the anchorage in Selat Tebang, after clearing the foul

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Chart 2244.

ground extending south-westward from Mantang kechil as directed on page 102, a vessel should keep the western extremity of Batu Tumpik and Tanjong Muning in line, bearing 355°.

Chart 2660a.

NATUNA EILANDEN.—Natuna eilanden lie somewhat out of the main route between Singapore and Hong Kong.

Laut (*Lat. 4° 46′ N., Long. 108° 00′ E.*), the northernmost of the group, lies about 120 miles north-eastward of Anambas eilanden, and about 75 miles south-eastward of the main route up the China sea. For details of these islands, *see* China Sea Pilot, Vol. II.

Charts 1371, 1263.

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CHAPTER III

MAIN ROUTE TO HONG KONG—ISLANDS, BANKS, AND DANGERS

Chart 2660a.

WESTERN SIDE OF MAIN ROUTE.—Shoals.—Charlotte bank, with a depth of 5 fathoms (9^{m}1) over it, lies about 144 miles northward of Laut (page 107), and about 27 miles north-westward of the track usually taken by vessels proceeding between Singapore and Hong Kong.

Scawfell (*Lat. 7° 18′ N., Long. 106° 51′ E.*), with a least depth of 5 fathoms (9^{m}1) over it, and composed of coral, lies about 45 miles west-north-westward of Charlotte bank. At the time of its examination by H.M.S. *Waterwitch*, in 1908, Scawfell was not marked by discoloured water nor by overfalls. *See* " Caution " on page 212.

Climate and weather.—*See* page 36.

Currents.—*See* page 10.

PULAU CONDORE GROUP.—This group consists of about 12 islands, situated in the track of vessels proceeding between Singapore and Saïgon, about 110 miles eastward of Pointe Camau (Kamao) (page 167), and about 45 miles from the coast of South Viet-Nam. *Chart 1000.*

Pulau Condore.—Pulau Condore, the principal island, is mountainous; the summit, situated in the southern part of the island, is 1,913 feet (583^{m}1) high and flat. (*See* views facing this page.)

Pointe Daï Mui (N.E. point), the north-eastern extremity, lies about 7¼ miles north-eastward of the summit. The eastern side of the island is divided into two bays by a rocky peninsula terminating in Mui Con Chim (East point), situated about 3¾ miles southward of Pointe Daï Mui. Baie du Nord-est is entered close northward of Mui Con Chim.

Baie du Pénitencier (Great or East bay) is entered between Mui Con Chim and Baï Nhut, about 4¼ miles south-westward. Baï Nhut is the south-eastern extremity of Pulau Condore and rises to an elevation of 1,053 feet (321^{m}0) about half a mile north-westward.

Petite Condore, an islet, lies on the south-western side of Pulau Condore, separated from it by Cua Hong Dam (Gullet), a narrow opening, entered about 2¼ miles westward of Baï Nhut. La Dent, the summit of Petite Condore, 1,047 feet (319^{m}1) high, on the eastern side of the islet, is prominent from southward or westward (*see* view on chart).

Baie du Sud-ouest (S.W. bay) is entered between Pointe Ouest

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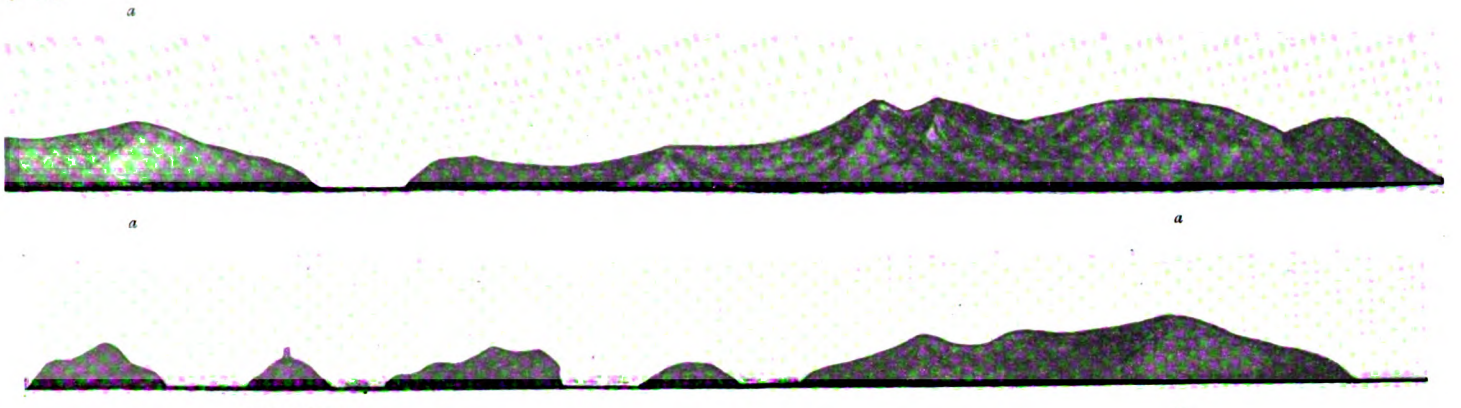
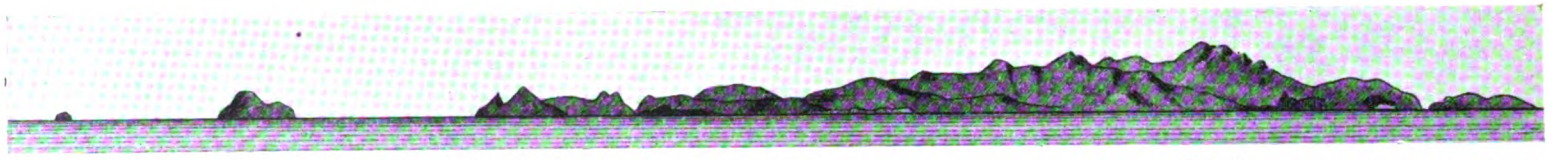


View, in two parts, of Pulau Condore from north-eastward.

(*Original dated* 1916.)



Pulau Condore from a position about 8 miles northward of Pointe Daï Mui.

(*Original dated* 1928.)

Pulau Condore from south-westward.

(*Original dated* 1928.)

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Chart 1000.

(West point), the western extremity of Petite Condore, and a point on Pulau Condore about 1½ miles north-eastward.

Communication.—There is steamer communication with Saïgon. Pulau Condore is connected to the general telegraph system.

Islets and dangers.—Light.—Several islets, most of which are high and wooded, lie off Pulau Condore.

Rocher Blanc (White rock) (*Lat. 8° 47′ N., Long. 106° 43′ E.*), 184 feet (56^{m}1) high, lies 3¼ miles north-eastward of Pointe Dai Mui.

Chart 2660a.

There is an 8-fathom (14^{m}6) bank about 13 miles east-north-eastward of Rocher Blanc.

Chart 1000.

Hon Cau (Kao), 787 feet (240^{m}0) high, lies about 4½ miles eastward of Mui Con Chim.

Hon Baï Canh (Kan), 1,073 feet (327^{m}1) high, lies in the approach to Baie du Pénitencier, about 2 miles west-south-westward of Hon Cau. Foul ground extends about 4 cables westward from the north-western end of Hon Baï Canh, and the south-western side of the islet is fringed by a reef. A spit, with depths of less than 3 fathoms (5^{m}5) over it, extends about 6½ cables southward from the southern side of the foul ground.

A light is exhibited, at an elevation of 696 feet (212^{m}1), from a white square tower on a dwelling with a red roof, about 52 feet (15^{m}8) in height, near the eastern extremity of Hon Baï Canh.

Hon Bong Lang (Hon Lap) lies about 2¾ cables southward of Hon Baï Canh. A 2½-fathom (4^{m}1) patch lies about 2½ cables north-eastward of Hon Bong Lang. Hon Taï Lon (Leung), 555 feet (169^{m}2) high, and fringed by a reef, lies about 8½ cables eastward of Baï Nhut. Hon Nghe (Hon Gué), with a prominent limekiln on it, lies near the extremity of a reef, which extends about 1½ cables eastward from Hon Taï Lon.

Banc des Tortues, with depths of less than 5 fathoms (9^{m}1) over it, and several patches of less than 3 fathoms (5^{m}5), extends from the western side of Hon Baï Canh to the northern end of Hon Taï Lon.

Two shoals, with depths of 4¼ and 5 fathoms (7^{m}8 and 9^{m}1) over them, lie about 5½ and 7½ cables, respectively, northward of the northern extremity of Hon Taï Lon, and a 5¼-fathom (9^{m}6) patch lies about 11½ cables north-north-eastward of the same point. Roche du Courrier, with a depth of 2¾ fathoms (5^{m}0) over it, lies about one mile south-westward of the western extremity of Hon Baï Canh.

Hon Chac Lon (Hon Cha) lies midway between Hon Taï Lon and Baï Nhut. A reef extends about 2¼ cables east-north-eastward from Hon Chac Lon; near the extremity of the reef is Hon Chac Nho. A spit, with depths of less than 5 fathoms (9^{m}1) over it, extends about 4 cables north-north-eastward from Hon Chac Lon, and a detached 4½-fathom (8^{m}2) patch lies about one cable north-westward of the outer extremity of the spit.

The dangers in Baie du Pénitencier are described on page 110.

A bank, with depths of less than 5 fathoms (9^{m}1) over it, extends about 6½ cables from the southern side of Pulau Condore.

Petite Condore, on the south-western side of Pulau Condore, has been described on page 108.

Charts 2414, 2660a, 1263.

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Chart 1000.

Hon Vung (Hon Vioum) lies close off the southern extremity of Petite Condore. Banc d' Hon Vung, with depths of from 3½ to 5 fathoms (5m9 to 9m1) over it, lies from 2 to 12 cables eastward of the islet. A shoal, with a depth of 2 fathoms (3m7) over it, the position of which is doubtful, is charted about 4½ cables westward of the islet.

Hon Troc (Hon Tap) lies about 1½ miles north-north-eastward of Pointe Ouest, and is connected to the western side of Pulau Condore by a shallow ridge. A reef, on which are some rocks above water, extends about 1½ cables north-westward from the north-western extremity of Hon Troc; a rock, above water, lies close off the south-western side of the islet, and a 5½-fathom (9m6) patch lies about 3½ cables westward of this rock.

Hon Tré Lon (Hon Taé), with an islet close off its eastern extremity, lies about one mile north-westward of Hon Troc.

Hon Thré Nho (Hon Taé Niao) lies about 2½ miles north-eastward of Hon Tré Lon, and about 8 cables off the north-western side of Pulau Condore. Reefs and rocks, above water, extend a short distance from the western side of Hon Thré Nho and about one cable from its northern side.

Baie du Pénitencier.—Dangers.—Lights.—Baie du Pénitencier (page 109) can be approached by three channels; from north-eastward between Mui Con Chim and Hon Baï Canh; from south-eastward between Hon Nghe and Hon Baï Canh, and from southward between Baï Nhut and Hon Chac Lon. The bay is only available during the South-west monsoon.

Inside the line joining the entrance points, the northern part of the bay is encumbered with many detached shallow patches, the positions of which can best be seen on the chart.

Baï Dat Gioc (Galle bay), shallow and foul, is entered between a point, situated about half a mile westward of Mui Con Chim, and Mui Dat Gioc (Galle point), about 1½ miles farther westward. A reef, which dries from 3 to 5 feet (0m9 to 1m5), extends about one mile south-westward from Mui Dat Gioc, and about three-quarters of a mile from the north-western shore of the bay. Foul ground extends about 6 cables southward from this reef, terminating in Roche du Milicien, which dries one foot (0m3), situated about 1¾ miles south-south-westward of Mui Dat Gioc. Between the foul ground and the south-western shore of the bay, vessels can enter the inner part of the bay in depths which gradually decrease towards the north-western shore.

Pulau Condore village, with a pier (*Lat. 8° 41′ N., Long. 106° 36′ E.*), is situated on the north-western shore about one mile south-westward of Mui Dat Gioc. Landing can be effected at the pier except at low water. There is a French penal settlement in Baie du Pénitencier.

There is a remarkable rock about 1½ miles south-south-westward of the pier, on the northern slope of the hills, about 3 cables inland. On the south-western shore of the bay is a prominent white-washed mark, situated about half a mile south-eastward of the remarkable rock.

Leading lights are established on the north-western shore of the bay. The front light is exhibited, at an elevation of 48 feet (14m6), from a white pyramidal structure, about 22 feet (6m7) in height, situated about half a mile west-south-westward of the pier. The

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Chart 1000.

rear light is exhibited, at an elevation of 81 feet (24m7), from a white pyramidal structure, about 31 feet (9m4) in height, about 4¾ cables north-westward of the front light. These lights, in line, bear 339°.

A light is exhibited on the head of the pier at Pulau Condore village.

A light is exhibited, at an elevation of 13 feet (4m0), on the prominent white mark.

Anchorages.—Mooring buoy.—Baie du Nord-est affords convenient shelter in the South-west monsoon for vessels not wishing to enter Baie du Pénitencier. Baie du Nord-est is free from danger but the depths decrease rapidly within the 5-fathom (9m1) line; vessels should, therefore, anchor in a depth of 7 fathoms (12m8), mud.

A good berth for deep draught vessels, which must enter by the north-eastern channel, is with the summit of Hon Taï Lon bearing 182° and Hon Bong Lang, 095°, in depths of between 6 and 7 fathoms (11m0 and 12m8).

During the strength of the South-west monsoon, in order to avoid the sea, vessels drawing less water, should anchor westward of the above position; although the squalls are strong there, the holding ground is good, being composed of grey mud. There appears to be good anchorage with Baï Nhut, bearing between 199° and 176°, and Hon Bong Lang, bearing between 092° and 098°, in depths of from 4½ to 5½ fathoms (8m2 to 10m1).

Mouillage de la Pierre Blanche (*Lat. 8° 39′ N., Long. 106° 36′ E.*), an inner anchorage in Baie du Pénitencier, is with the pier bearing 010°, distant 8 cables, in depths of between 3½ and 4 fathoms (6m4 and 7m3).

A mooring buoy is situated about 4 cables south-south-westward of the pier in Baie du Pénitencier.

Baie du Sud-ouest is well sheltered by the surrounding hills, except from north-westward, but the wind is seldom strong from that quarter. Vessels may anchor, in a depth of between 6 and 7 fathoms (11m0 and 12m8), with good holding ground, of gravel and mud; the heavy squalls, however, necessitate precaution. The head of the bay dries for a distance of about half a mile offshore.

Directions.—Approaching Baie du Pénitencier through the north-eastern channel, after clearing the foul ground westward of Hon Baï Canh, a vessel can avoid Roche du Courrier by keeping Rocher Blanc open twice its breadth south-eastward of Mui Con Chim, the latter bearing about 033°. When the remarkable rock, inland, on the south-western side of the bay, bears 263°, or the white mark on the shore bears 255°, Roche du Courrier will have been passed, and the vessel can steer for Baï Nhut and anchor as convenient.

Entering from south-eastward, a vessel should steer to pass about one cable north-eastward of Hon Nghe, and about midway between the islet and the 2½-fathom (4m6) shoal near the south-western end of Banc des Tortues. In this channel there are depths of from 3¼ to 9 fathoms (5m9 to 16m5) in the fairway.

Entering from southward, the channel between Baï Nhut and Hon Chac Lon is deep, but the depths decrease somewhat rapidly northward of the entrance. The two light-structures in line, bearing 339°, lead towards Mouillage de la Pierre Blanche.

Chart 2414.

Outlying islets and banks.—Les Frères (Brothers) are two islets,

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Chart 2414.

about 3½ miles apart in a north-easterly direction, situated about 24 miles westward of Petite Condore.

The south-western islet, named Hon Trung Nho (*Lat. 8° 35′ N., Long. 106° 07′ E.*), is 39 feet (11m9) high, with patches of vegetation; it appears white from eastward and the sea breaks heavily on its eastern side during strong winds.

The north-eastern islet, named Hon Trung Lon, is 151 feet (46m0) high and round; the upper half is covered with vegetation.

Chart 2660a.

Banc Callou, with a least depth of 4½ fathoms (8m2) over it, lies about 66 miles north-eastward of Pulau Condore. Banc Wallace, with a least depth of 4¾ fathoms (8m7) over it, lies about 11 miles north-north-eastward of Banc Callou.

Charts 1261, 2660a.

Royal Bishop banks, composed of coral, lie about 100 miles north-eastward of Pulau Condore, and about 58 miles from the coast of Central Viet-Nam. The least depth over these banks is 4¼ fathoms (7m8). A shoal head, with a depth of 4½ fathoms (8m2) over it, lies 5 miles westward, and another, with a depth of 4¾ fathoms (8m7) over it, lies about 6 miles north-eastward of the shoalest part. Two shoal heads, with depths of 7 fathoms (12m8) over them, lie respectively, about 20 miles north-eastward and 13 miles eastward of the shoalest part, and about 10 and 19 miles, respectively, south-south-eastward of the shoalest part there are depths of 10 fathoms (18m3).

Chart 1261.

Bancs de l'Astrolabe, two detached coral patches, 6 miles apart, lie about 30 miles north-north-westward of the shoalest part of Royal Bishop banks. The western shoal has a depth of 2½ fathoms (4m6) over it, and the eastern shoal has a depth of 4¼ fathoms (7m8) over it; a patch, with a depth of 7 fathoms (12m8) over it, lies about 13 miles east-south-eastward of the eastern of these two shoals.

PULAU CECIR DE MER.—Dangers.—Pulau Cecir de Mer lies about 175 miles north-eastward of Pulau Condore and about 40 miles off the coast of Central Viet-Nam. The island has two hills near its northern end. The south-western hill is 349 feet (106m4) high and has a round top; the north-eastern hill, 293 feet (89m3) high, is conical and several masses of rock near its summit give it a jagged

Pulau Cecir de Mer, bearing 240°, distant 10 miles.
(*Original dated* 1933.)

appearance. The island is well cultivated, but no supplies can be obtained.

Some rocks, one of which is 67 feet (20m4) high, lie on the outer edge of the coastal reef which extends about a half mile north-eastward from the island. On the eastern side of the island is a sandy bay, in which there is a detached reef, which dries about 3 feet (0m9), and a bank, with depths of less than 3 fathoms (5m5) over it, extends nearly one mile offshore.

Charts 2660a, 1263.

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Chart 1261.

A reef extends about 1½ miles south-south-eastward from Pulau Cecir de Mer; Îlot du Sud (South islet), 148 feet (45m1) high, lies near the centre of the reef, and a black rock, 56 feet (17m1) high, lies close south-eastward of Îlot du Sud (*Lat. 10° 29′ N., Long. 108° 58′ E.*). A bank, with a depth of 2 fathoms (3m7) over it, extends about 3 cables from the south-western side of Pulau Cecir de Mer.

Anchorages.—In seeking anchorage off Pulau Cecir de Mer it must be borne in mind that the reef surrounding the island is steep-to.

There is fair anchorage, during the North-east monsoon, off the sandy shore forming the south-western and western sides of the island, in depths of from 13 to 16 fathoms (23m8 to 29m3), sand and shells, but the best position is just southward of the south-western extremity, about half a mile off the coastal reef, in depths of from 10 to 14 fathoms (18m3 to 25m6).

It is possible to obtain shelter from the South-west monsoon off the north-eastern end of the island, in depths of from 14 to 15 fathoms (25m6 to 27m4), but the bottom is rocky and the holding ground bad; it cannot be recommended as an anchorage. There is, however, a good anchorage with the 67-foot (20m4) rock off the north-eastern end of the island, bearing 170°, distant 11 cables.

Banks and dangers westward of Pulau Cecir de Mer.—Rocher Elevé (High rock) (*Lat. 10° 37′ N., Long. 108° 52′ E.*), 59 feet (18m0) high and frequented by sea birds, lies on a bank, with depths of from 6½ to 10 fathoms (11m9 to 18m3) over it, about 5 miles north-westward of Pulau Cecir de Mer; close northward of the rock is another rock, above water, with a rock, awash, beyond it.

Holland bank, composed of coral, lies about 11 miles west-north-westward of Rocher Elevé. The least depth found on the bank was 2 fathoms (3m7) and there are depths of 2½ and 3 fathoms (4m6 and 5m5) on its south-eastern side, which is very steep-to.

The depths in the channel between Rocher Elevé and Holland bank are very irregular, varying from 7 to 27 fathoms (12m8 to 49m4). Two banks, one with a depth of 6 fathoms (11m0), coral, over it, and the other with a depth of 8½ fathoms (15m6) over it, lie, respectively, about 4 miles north-north-eastward and 6 miles north-north-westward of the shoalest part of Holland bank.

Vessels should give Holland bank a wide berth as depths in its vicinity are so irregular that it cannot be approached with safety by sounding.

For Rivier bank, which lies about 10 miles west-north-westward of Holland bank, together with other banks south-westward and north-eastward of the former, off the coast of Central Viet-Nam, *see* page 233.

Marne bank, with a least known depth of 9 fathoms (16m5) over it, lies about 20 miles west-south-westward of Pulau Cecir de Mer; this bank has not been examined.

A coral shoal, with a depth of 7½ fathoms (13m7) over it, was reported, in 1924, by s.s. *Narbo*, to lie about 15 miles south-westward of Pulau Cecir de Mer.

A shoal, the position of which is approximate, with a depth of 11 fathoms (20m1) over it, was reported in 1947, by s.s. *Empire Park*, to lie about 25 miles south-westward of Marne bank.

Islets and dangers southward of Pulau Cecir de Mer.—The

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Chart 1261.

three Îles Catwick mark an area southward of Pulau Cecir de Mer, of irregular depths in which signs of volcanic activity have been noted, and great caution is necessary when navigating in the vicinity. In 1923, two volcanic islands, which have since been levelled by the action of the sea and no longer constitute a danger to navigation, were formed about 10 miles northward of Îles Catwick.

Îlot Sapate (Pulo Sapatu) (*Lat. 9° 59′ N., Long. 109° 05′ E.*), 364 feet (111m0) high and barren, is the highest and easternmost of Îles Catwick and lies about 32 miles south-south-eastward of Pulau Cecir de Mer. Viewed from some directions, Île Sapate resembles a shoe; from others, it appears as a square column, and from eastward, as a pyramid.

With the exception of a rock, awash, lying close eastward of its southern end, the island is steep-to. Under very favourable circumstances landing may be effected on the rocks at the southern end, otherwise the island is inaccessible. It is frequented by sea-birds in the breeding season. It is possible to anchor eastward of Îlot Sapate, in a depth of about 16 fathoms (29m3), but the holding ground is not good.

Discoloured water was reported, in 1928, in a position about 8½ miles south-south-westward of Îlot Sapate.

Julia shoal, composed of coral, with a depth of 3¼ fathoms (5m9) over it, lies about 3½ miles south-eastward of Îlot Sapate. A vessel will clear Julia shoal if Petite Catwick is kept well open either north-eastward or south-westward of Îlot Sapate.

Petite (Little) Catwick, a pyramidal rock, 59 feet (18m0) high, and steep-to, lies about 2 miles north-westward of Îlot Sapate. It is possible for a vessel to anchor about 2 cables north-eastward of the rock, in a depth of about 11 fathoms (20m1), but the rock gives no shelter.

In the channel between Îlot Sapate and Petite Catwick the currents are strong and irregular in the vicinity of these islands.

Grande (Great) Catwick, a round, barren rock, 196 feet (59m7) high, lies about 9 miles west-north-westward of Petite Catwick. A reef extends about 1½ cables south-eastward from Grande Catwick. It is possible to anchor about 1½ cables northward of Grande Catwick, in a depth of about 22 fathoms (40m2). The rock, which can be climbed, is frequented by sea-birds.

La Paix, a rock awash, lies in the channel between Petite Catwick and Grande Catwick, about 4½ miles eastward of the latter. This rock is small and steep-to; except in calm weather, the sea always breaks on it.

Yusun shoal is a coral patch, with a depth of 3¾ fathoms (6m9) over it, lying in the channel between Îlot Sapate and Pulau Cecir de Mer, about 18 miles northward of the former. In fine weather Yusun shoal is not easily seen, but in the strength of the monsoon the sea has been observed to break on it.

Chart 2660a.

Banks eastward and north-eastward of Pulau Cecir de Mer.—At various times between 1821 and 1936, banks, with depths of between 20 and 40 fathoms (36m6 and 73m2) over them, have been reported to lie in the vicinity of the main route to Hong Kong, as indicated on the chart, between a position about 50 miles eastward of Îlot Sapate

Chart 1263.

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Chart 2660a.

and a position about 85 miles eastward of Pulau Cecir de Mer. It is possible that volcanic eruptions have produced the banks reported, but successive searches by H.M. surveying vessels, between 1909 and 1937, have proved that all these banks have subsided, and that, although the bottom is uneven thereabouts, no bank exists over which there is a less depth than 200 fathoms (365m8).

Light patches of water caused by currents were seen on several occasions by H.M.S. *Herald* in April, 1937, in approximately lat. 10° 02′ N., long. 109° 51′ E.

Chart 1263.

PARACEL ISLANDS.—General remarks.—Currents.—The Paracel islands are an extensive group of low coral islands and reefs lying on the western side of the main route between Singapore and Hong Kong, about 370 miles north-eastward of Pulau Cecir de Mer and about 165 miles off the coast of Central Viet-Nam.

For general remarks on currents, *see* pages 10-18.

Chart 94.

The islands consist of two principal groups, the Amphitrite and the Crescent, and several islets and reefs. They were annexed by the Chinese government in 1909, and are often visited by junks.

In fine weather and a clear atmosphere there is no difficulty in navigating between the reefs of the Paracel groups with a look-out aloft, as the trees on the several islands, the heads of rock above water on some of the reefs, and the sea breaking over most of them, give warning of approach to the dangers; though the Neptuna banks (page 116) were reported, in 1936, to be extremely difficult to see. In misty or bad weather they should be avoided, and there seems to be nothing to be gained in passing between them unless seeking anchorage.

The current is generally influenced by the wind in both monsoons, but in light winds, between the monsoons, it continually changes its direction among the reefs, and sometimes attains a rate of 2 knots.

Southern group of reefs.—Caution.—Triton island (*Lat. 15° 47′ N., Long. 111° 12′ E.*), the south-westernmost of the Paracel islands, is a sand cay, about 10 feet (3m0) high; it lies on a coral reef which extends about one mile north-eastward from the island and about half a mile in other directions. The reef has a depth of not more than 6 feet (1m8) over it and is steep-to. Triton island is the breeding place of sea birds.

In 1950, there was the wreckage of an aircraft, which was prominent, north-eastward of the island.

Passu Keah is a sand cay about 35 miles east-north-eastward of Triton island. It is situated near the western end of a coral reef, which extends about 4 miles eastward from the cay. The edge of the reef is steep-to.

Discovery reef, enclosing a lagoon, lies about 8 miles northward of Passu Keah. The outer edge of this reef is steep-to with several rocks above water on it. There is a depth of barely 2 fathoms (3m7) over any part of the reef; in the reef are two openings, which can be used by boats, one on its southern side and a narrower one on its northern side. The overfalls are very heavy on the reef.

Vuladdore reef, on which are a few small above-water rocks, and

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Chart 94.

over which the sea breaks heavily at times, lies about 10 miles north-eastward of Discovery reef.

Bombay reef, enclosing a lagoon, lies about 39 miles eastward of Passu Keah and is the south-easternmost reef in the group. Some of the rocks on the edge of the reef are awash and four of them are above water; the reef is steep-to and the sea breaks over it. There is an opening in the reef near its south-western extremity and it is possible for boats to enter the shallow rock-strewn lagoon within; during the North-east monsoon the best time for entering is about 3 hours after low water, when the reef begins to cover and the current has eased. A wreck near the north-eastern end of the reef and several boilers, being the remains of wrecks, on the northern edge, are conspicuous, and there is some wreckage on the south-eastern edge of the reef. Bombay reef has, at various times, been reported to lie in a position other than that charted, and vessels should navigate with caution in the vicinity.

Banks.—Herald bank, with a least depth of 129 fathoms (235^{m}9) over it, lies about 22 miles south-westward of Bombay reef.

Bremen bank lies about 13 miles northward of Bombay reef; the least depth over the bank, about 7 fathoms (12^{m}8), is situated on its south-western end.

Jehangire bank, the depths over which are very irregular, consists of three detached patches lying about 4 miles east-north-eastward of Bremen bank. The south-western patch has a depth of 15 fathoms (27^{m}4) over it, the south-eastern patch has a least known depth of 7 fathoms (12^{m}8) over it, and the northern patch a depth of 8 fathoms (14^{m}6) over it.

Neptuna banks, consisting of two coral patches, are situated northward of Bremen bank. The north-eastern patch, with a least depth of 8 fathoms (14^{m}6) over it, lies about 6½ miles west-south-westward of Pyramid rock (page 118); the south-western patch, with a least depth of 10 fathoms (18^{m}3), lies about 3 miles farther south-westward. Both these patches are extremely difficult to see and there are depths of over 100 fathoms (182^{m}9) close north-westward of them.

Crescent group.—Light.—The Crescent group consists of several low sand islands and numerous reefs in the form of a crescent, about 43 miles north-eastward of Triton island (page 115).

Money island (*Lat. 16° 27′ N., Long. 111° 30′ E.*), about 20 feet (6^{m}1) high and covered with brushwood, lies at the western end of a reef which is separated from the south-western horn of the crescent by a channel about 1½ miles wide. Several sand cays lie eastward of Money island on the same reef.

A tidal stream, with a rate of 1½ knots, has been observed in the south-eastern entrance, but within the anchorage the stream is inappreciable.

Antelope reef, which partly dries, forms the south-western horn of the crescent; a cay is situated on the south-eastern extremity of the reef.

Robert island, 26 feet (7^{m}9) high, fringed by a reef and covered with vegetation, lies about half a mile northward of Antelope reef. There was, in 1950, one building on the island and a pier on its south-eastern side. A bank, with depths of less than 3 fathoms (5^{m}5) over it, extends about half a mile north-eastward and northward from the island.

Charts 2661a, 1263.

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Chart 94.

Pattle island, about 30 feet (9m1) high, and covered with brushwood and mangroves, lies about 2 miles north-eastward of Robert island. There are two large buildings in the middle of the island, and a prominent pylon about midway between the buildings and the south-western extremity of the island. There is a flagstaff on the eastern building.

A light is exhibited from the middle of the western building on Pattle island.

The reef fringing the island extends a short distance south-westward and about 1¾ miles north-eastward; there is a rock, above water, on the edge of the reef about 2 cables northward of Pattle island.

On either side of the reef there is a clear channel. On the southern side of the island there is a bight where boats may land at low water, but there are stones near the shore.

A 2½-fathom (4m1) coral patch, and a 5½-fathom (10m1) shoal, lie about 1½ and 2 miles, respectively, eastward of the light-structure on Pattle island (*Lat. 16° 32′ N., Long. 111° 36′ E.*).

Observation bank, with a brushwood-covered sand cay on it, lies at the northern end of the Crescent group, about 6 miles north-eastward of Pattle island. The reef surrounding the cay extends about one mile north-westward and south-eastward from it.

About midway between Observation bank and the reef extending north-eastward from Pattle island there is a detached reef, close off the southern end of which is a detached 2¾-fathom (5m0) patch, and close off its north-eastern end is a small detached reef.

In the channel between the last mentioned detached reef and the reef extending westward from Observation bank is a patch, with a depth of 4¼ fathoms (7m8) over it.

Drummond island, covered with brushwood and mangrove trees, about 15 feet (4m6) high, lies about 7 miles south-south-eastward of Observation bank, the space between being occupied by foul ground. The reef surrounding Drummond island extends a short distance from the southern end of the island and about 4 miles north-eastward, whence it curves north-westward for about another 4 miles. On the reef between Observation bank and Drummond island are several sand cays, from 3 to 10 feet (0m9 to 3m0) high, some of which may be covered with brushwood. For anchorage, *see* page 120.

Duncan islands, two in number, forming the south-eastern horn of the crescent, lie about 1½ miles south-westward of Drummond island, separated from the latter by a navigable channel. The islands consist of coral and are connected by a sand spit; they are covered with shrubs and are surrounded by a reef which extends a short distance northward and nearly half a mile southward from the islands. The reef is steep-to with the exception of a rock, with a depth of less than 6 feet (1m8) over it, which lies close south-eastward of the eastern island. There are trees, about 13 feet (4m0) high, on the eastern island, and on its southern side are two prominent palm trees, near which is a well. The bushes on the western island are about 10 feet (3m0) high, and a large bush, near the middle of the island, about 20 feet (6m1) high, stands well above the remaining vegetation. For anchorage, *see* page 120.

In the channel between the Duncan islands and Antelope reef (page 116), there is a 5-fathom (9m1) patch lying about 2½ miles west-

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Chart 94.

ward of the former. Within the crescent the depths are irregular with coral heads in places, the positions of which can best be seen on the chart.

Lincoln island.—Dangers.—Lincoln island (*Lat. 16° 40′ N., Long. 112° 44′ E.*), the easternmost of the Paracel islands, lies at the extremity of a ridge, with irregular depths of less than 45 fathoms (82m3) over it, which extends about 22 miles north-north-eastward from Bremen and Jehangire banks. Lincoln island is about 15 feet (4m6) high, the north-eastern side being cliffy. The island is covered with brushwood and surrounded by a coral reef, which dries, extending a short distance from its south-western side and about 3 cables from its north-eastern side. A bank, with depths of less than 10 fathoms (18m3) over it, extends about 1½ miles north-westward from the island. A narrow coral bank, studded with rocks, extends about 11 miles southward from the south-eastern end of Lincoln island; it has not been examined and should not be crossed.

For anchorage off Lincoln island, *see* page 119.

Pyramid rock, 17 feet (5m2) high and cone-shaped, lies about 7 miles south-westward of Lincoln island; at a distance it might be mistaken for a junk.

Dido bank, discovered by H.M.S. *Dido*, in 1844, with a depth of 13 fathoms (23m8) over it, sand, and steep-to, lies about 12 miles north-eastward of Lincoln island.

Amphitrite group.—Light.—The Amphitrite group of islands consists of two portions separated from one another by a deep channel about 4 miles wide. The northern portion of the group consists of two reefs, separated from one another by Zappe pass, about half a mile wide; on these two reefs are several islands and sand cays. The southern portion consists of Woody and Rocky islands which stand on a reef, *see* page 119.

Tree island (*Lat. 16° 59′ N., Long. 112° 16′ E.*) lies about 32 miles north-westward of Lincoln island. It is covered with mangrove bushes and surrounded by a white sand beach; it can be identified by a palm tree near its centre.

The reef on which Tree island lies extends about 1½ miles eastward from the island and about 4½ miles westward; near the western end of the reef is a sand cay, named West Sand.

North island lies about 2 miles east-south-eastward of Tree island, separated from it by Zappe pass. A reef extends nearly half a mile north-westward from North island and about 4 miles south-eastward. Middle island and South island lie on the southern part of the reef, about half a mile and one mile, respectively, from North island. The above three islands are covered with mangrove bushes. Near the south-eastern end of the reef are three sand cays, covered with vegetation; the south-easternmost cay is named South Sand.

Landing can be effected in the openings on the south-western side of this reef between the islands and cays. For anchorage, *see* page 119.

Zappe pass, with a least known depth of 2½ fathoms (4m6) in mid-channel, is only available for small craft. With a fresh breeze breakers extend across the pass and there is usually a strong current running through it.

Chart 94, plan of Woody island.

Woody island, surrounded by a white sand beach and covered with

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Chart 94, plan of Woody island.

trees, lies about 9 miles south-south-eastward of Tree island; landing can be effected on the lee side.

Rocky islet, about 45 feet (13m7) high, lies near the outer edge of a reef, which dries, extending nearly three-quarters of a mile north-eastward from Woody island; a bank, with depths of less than 10 fathoms (18m3) over it, extends about 4 cables northward from the reef.

A light is exhibited, at an elevation of 68 feet (20m7), from a white mast on Rocky islet; the light is obscured on certain bearings by Woody island.

A bank, over which the depths are very irregular, extends about 3½ miles south-eastward from Woody island and Rocky islet; there is a depth of 2¾ fathoms (5m0) about 1½ miles eastward of Woody island, and a depth of 4¾ fathoms (8m7) about 2¾ miles south-eastward of the same island.

For anchorage off Woody island, *see* below.

Chart 94.

Iltis bank, with depths of from 8 to 10 fathoms (14m6 to 18m3) over it, lies about 7 miles south-westward of Woody island.

Another bank, with a depth of 12 fathoms (21m9) over it, lies about 4 miles southward of Woody island (*Lat. 16° 50′ N., Long. 112° 20′ E.*).

Current.—The current in a position about 3 miles south-eastward of Bombay reef was reported in January, 1951, to set 040°, at a rate of from 1½ to 2 knots.

North reef.—The eastern end of North reef lies about 42 miles west-north-westward of Tree island. From the above position, North reef extends about 6½ miles westward, enclosing a lagoon. The edge of the reef, all round, has rocks just above water, and the noise of the breakers on the reef may be heard for a considerable distance at times. On the south-western side of the reef is a boat passage into the lagoon. Two conspicuous boilers lay on the southern side of North reef, in 1923, and, in 1946, a prominent stranded wreck lay about 8 cables westward of a boiler, and wreckage was situated on the north-eastern edge of the reef.

Anchorages.—Directions.—The anchorages amongst the Paracel islands are mostly open, affording shelter only with the wind off the islands.

Good anchorage can be obtained in either monsoon under the lee of Lincoln island, about half a mile offshore, in a depth of 10 fathoms (18m3), coral.

Junks visiting these islands during the North-east monsoon period, anchor close off the south-western side of Tree island, in a depth of 13 feet (4m0). The channel leading to this anchorage is on the southern side of the reef and is 2 cables wide, with a depth of from 4 to 6 feet (1m2 to 1m8) in the fairway.

Anchorage is indicated on the chart about one mile southward of Tree island.

There is anchorage under North and Middle islands, in depths of from 11 to 16 fathoms (20m1 to 29m3), sand.

Chart 94, plan of Woody island.

During southerly winds, good anchorage may be obtained in a position about half a mile from the reef fringing the northern side of Woody island, in a depth of 13 fathoms (23m8), sand.

Charts 2661a, 1263.

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Chart 94, plan of Woody island

In north-easterly winds there is good anchorage 7 cables south-westward of the observation spot on the north-western extremity of Woody island, in a depth of from 18 to 20 fathoms (32m9 to 36m6), sand.

Chart 94.

Anchorage is indicated on the chart close to the reef northward of Money island (*Lat. 16° 27′ N., Long. 111° 30′ E.*).

The best anchorage in the Crescent group is near the reef on the northern side of Duncan islands, in depths of from 10 to 15 fathoms (18m3 to 27m4), where there are some broad patches of sandy bottom.

There is anchorage close off the reef on the western side of Drummond island.

In using the channel between Drummond island and Duncan islands, vessels should pass between a quarter and half a mile north-eastward of the latter islands.

Chart 2661a.

Outlying shoal.—St. Esprit shoal (*Lat. 19° 33′ N., Long. 113° 02′ E.*) lies near the edge of the 100-fathom (182m9) line about 113 miles eastward of the eastern point of Hainan island. The shoal, on which the least depth obtained was 7 fathoms (12m8), is situated about 35 miles westward of the main route to Hong Kong as indicated on the chart.

Strong tide-rips have been observed in the vicinity of St. Esprit shoal, but on examination deep water was found to exist. The current was observed to set generally with the wind.

In 1946, depths of from 28 to 48 fathoms (51m2 to 87m8) were reported between positions about 35 and 72 miles south-westward of St. Esprit shoal.

Chart 1263.

EASTERN SIDE OF MAIN ROUTE.—Caution.—Vessels bound from Singapore to Hong Kong should not attempt to pass between the banks, described hereafter in this chapter, and the numerous shoals which exist over a very large area between the parallels of 7° 33′ N. and 12° 00′ N., and the meridians of 112° 50′ E. and 117° 44′ E., enclosed on the charts by a pecked line. This area is known as "Dangerous Ground" and has not been surveyed. The shoals on the eastern side of "Dangerous Ground" are described in China Sea Pilot, Volume II.

Currents.—H.M.S. *Rifleman*, when surveying in the vicinity during the years from 1864 to 1868, anchored on most of the banks and reefs which exist between the Main route and "Dangerous Ground," and observed that, for sixteen hours out of the twenty-four, the current invariably set to windward, generally at the greatest rate when the monsoon was strongest.

For general remarks on currents, *see* page 10.

Chart 2660a.

SOUTHERN GROUP.—Banks.—Dangers.—Vanguard bank, with a least depth of 9 fathoms (16m5) over it, lies about 60 miles south-eastward of the main route between Singapore and Hong Kong; its southern extremity is situated about 173 miles north-north-east-

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Chart 2660a.

ward of Laut, page 107. There is a depth of 11 fathoms (20m1) (*Lat. 7° 30′ N., Long. 109° 55′ E.*) on the eastern end of Vanguard bank, about 30 miles north-eastward of the southern extremity.

Prince Consort bank, composed of sand and coral, lies about 12 miles north-north-eastward of Vanguard bank, the least depth found being 10 fathoms (18m3), near the north-western edge of the bank. Depths of 12 and 13 fathoms (21m9 and 23m8), coral, exist on the western edge of the bank, southward of the shoalest part.

Grainger bank, with depths of from 6 to 8 fathoms (11m0 to 14m6) over it, coral, lies about 35 miles east-north-eastward of the eastern end of Vanguard bank. The coral bottom of Grainger bank is visible over nearly the whole of it.

Prince of Wales bank, with a depth of 4 fathoms (7m3) over it on its western side, lies about 12 miles northward of Grainger bank; it is of coral formation and the depths over it are very irregular.

Alexandra bank, with a depth of 3 fathoms (5m5) over it on its eastern side, lies about 2 miles south-eastward of Prince of Wales bank; the coral bottom of this bank is distinctly visible.

Charts 2660a and b.

Rifleman bank consists of sand and coral with shallow patches round the edges within which are greater depths. Bombay Castle (*Lat. 7° 56′ N., Long. 111° 42′ E.*), a shoal with a depth of 1¾ fathoms (3m2) over it, and over which the sea breaks except in the finest weather, is the shoalest part of Rifleman bank and is situated on its northern end about 64 miles eastward of Alexandra bank. Johnson patch, with a depth of 4 fathoms (7m3) over it, lies on the western side of Rifleman bank; Kingston shoal, with a depth of 6 fathoms (11m0) over it, lies at its southern end; and Orleana shoal, with a depth of 4½ fathoms (8m2) over it, lies on the eastern side.

Owen shoal, reported by the ship *David Scott*, in 1835, to have a depth of 3½ fathoms (6m4) over it, coral, is charted about 20 miles north-eastward of Rifleman bank. It has not been examined.

Chart 2660b.

Amboyna cay.—Anchorages.—Amboyna cay (*Lat. 7° 52′ N., Long. 112° 55′ E.*), 8 feet (2m4) high, lies about 70 miles eastward of Rifleman bank, near the south-western edge of the "Dangerous Ground" mentioned on pages 1 and 120. The cay is composed of two parts, the eastern consisting of a beach of sand and broken coral, and the western being covered with a bed of guano, strewn with debris. It is surrounded by coral ledges, which partly dry, extending 2 cables offshore in places, and upon which the sea breaks heavily with any swell. In 1933, there were traces of old habitations and there was a flagstaff and a temporary beacon on the cay.

A reef extends about half a mile north-westward from Amboyna cay, and a bank, 2 cables wide, extends about one mile north-eastward. There is a depth of 4 fathoms (7m3) over the bank about 3½ cables from the cay, and a depth of 9 fathoms (16m5) at its outer edge, where it is steep-to. Fairly sheltered anchorage was obtained by H.M.S. *Rifleman* on this bank, in the South-west monsoon, in a depth of 5 fathoms (9m1). In 1933, the French surveying vessel *Astrolabe* anchored with the flagstaff bearing 106°, distant about 3½ cables, in a depth of 6½ fathoms (11m9). It is also possible to anchor south-eastward of the cay with the flagstaff bearing 300°, at a distance of 2½ cables. Good anchorage

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Chart 2660b.

is also obtainable with the centre of the cay bearing 224°, distant one mile, in a depth of 8 fathoms (14m6).

Caution is required when anchoring as the banks are exceedingly steep-to.

A reef, with depths of from 2 to 2½ fathoms (3m7 to 4m6) over it, was reported by H.M.S. *Wanderer*, in 1889, to lie about three-quarters of a mile north-westward of Amboyna cay. For tides and tidal streams at Amboyna cay, *see* below.

Stag shoal.—Stag shoal, about 33 miles northward of Amboyna cay, was reported, in 1802, in lat. 8° 24′ N., long. 112° 57′ E., as consisting of rocks showing above water. The shoal was not seen by H.M.S. *Renard*, in 1862, when in the vicinity, and, in 1867, H.M.S. *Rifleman* obtained a sounding of 1,085 fathoms (1,984m2), ooze, in its assigned position. It is possible that Stag shoal lies about 11 miles farther westward.

Charts 2660a and b.

Spratly island.—Anchorages.—Spratly or Storm island, about 8 feet (2m4) high, and flat, with a margin of white sand and broken coral, is situated about 43 miles northward of Rifleman bank (page 121) and is frequented by a large number of birds. In 1951, the island was covered with short grass, and there were the trunks of a number of coconut trees, all without tops, towards the south-western end. The island is surrounded by drying rocky ledges and coral heads, and lies on the southern edge of a coral bank, which is over one mile long, and about three-quarters of a mile wide. Depths of less than 3 fathoms (5m5) extend half a mile northward from the island; the east side is steep-to, with depths of 10 fathoms (18m3), within one cable of the shore; off the south-west and west sides depths of less than 3 fathoms (5m5) extend 2 cables offshore before the bottom falls away steeply into deep water.

Landing is possible on the lee side of the island during the South-west monsoon, but is dangerous in a swell on account of the numerous coral heads found close to the beach.

A vessel can anchor on the bank either north-eastward or south-westward of the island. The north-eastern anchorage appears to be the better, even with a north-easterly wind, as the bank is less steep-to there, but a vessel should nowhere venture into a depth of less than 10 fathoms (18m3), owing to the sheer and uneven nature of the bottom.

In April, 1951, H.M.S. *Dampier* anchored 6 cables north-eastward of the north-eastern end of the island, in a depth of 10 fathoms (18m3).

Ladd reef.—Ladd reef, composed of coral enclosing a lagoon with a bottom of white sand, lies about 15 miles westward of Spratly island. The reef dries in parts and, at low water, it is almost impossible for boats to cross over into the lagoon.

Tides and tidal streams.—By observations at Amboyna cay two days before neap tides, the water was found to commence rising at 2300 and falling at 0600, the rise and fall being doubtful. While the tide was rising the tidal stream set northward, while falling it set westward. The maximum rate of the tidal stream was about 1½ knots.

Observations at Spratly island in the summer months showed but one tide during the 24 hours, and in the early part of July it was found to be high water at 0900, the rise and fall being 5¼ feet (1m6).

Chart 1263.

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Charts 2660a and b.

The direction of the tidal stream at the north-eastern end of the bank was south-westward during the rising tide, and from south-eastward to north-eastward during the falling tide.

Chart 2660b.

London reefs.—London reefs, four in number, extend over a distance of about 38 miles in an easterly direction and are steep-to, thus rendering sounding of little value when approaching them, and great caution is necessary when navigating in their vicinity. They should not be approached with the sun ahead, when it becomes difficult to distinguish shoal water or breakers.

West reef (*Lat. 8° 51′ N., Long. 112° 13′ E.*), the westernmost of the London reefs, lies about 21 miles north-eastward of Spratly island. Round the edge of West reef are several detached coral heads, which dry, and on its eastern side, in 1865, there was a sand cay, 2 feet (0m6) high; in the middle of the reef there are depths of from 6 to 10 fathoms (11m0 to 18m3), with several coral heads. The only approach to the middle is from the south-eastern side, but there are so many coral patches navigation is hazardous.

There was a prominent wreck, in 1933, on the south-western extremity of West reef.

Central reef is a coral patch, awash, with a lagoon, in which there are depths of from 4 to 8 fathoms (7m3 to 14m6), within the belt of coral, lying about 8 miles north-eastward of West reef. On the south-western extremity of Central reef there was a sandbank, in 1865, which was reported to cover, probably, at high water springs. Unlike West and East reefs, this reef is not always marked by breakers.

East reef, enclosing a lagoon, in which there are depths of from 4 to 8 fathoms (7m3 to 14m6), lies about 16 miles eastward of West reef. The sea breaks heavily on the reef, and on its western extremity are one or two rocks which seldom cover; no entrance was discovered into the lagoon.

Cuarteron reef, about 10 miles eastward of East reef, dries and is encumbered by rocks, especially on its northern side, where some are from 4 to 5 feet (1m2 to 1m5) high. Anchorage was obtained by H.M. Surveying Ship *Herald*, in 1938, in a depth of about 15 fathoms (27m4), about one cable from the northern side; the southern side is steep-to. There is no lagoon.

The tidal streams set eastward and westward along the northern side of Cuarteron reef.

Although considerable depths were found, in 1865, close to all the London reefs, there was generally some slope from the edges on which H.M.S. *Rifleman* found safe anchorage for a short period, but on Cuarteron reef no anchorage could be found.

CENTRAL GROUP.—Reefs south-westward of Tizard bank.—This group of dangers lies close north-westward of the north-western edge of "Dangerous Ground."

Fiery Cross or N.W. Investigator reef lies near the western edge of "Dangerous Ground," about 48 miles north-eastward of Central reef. The reef is steep-to and composed of patches of coral, several of which dry or are awash, with depths of from 8 to 22 fathoms (14m6 to 40m2) between them. At high water the whole reef is covered except a prominent rock (*Lat. 9° 33′ N., Long. 112° 53′ E.*), about 2 feet (0m6)

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Chart 2660b.

high, situated, on the south-eastern side of the largest drying patch, near the south-western end of the reef; in fine weather, the sea does not break over this reef. In 1933, the French vessel *Alerte* anchored between two shoals near the north-eastern end of the reef, in a depth of 11 fathoms (20^{m}1). Anchorage is also obtainable about 2 cables from the reef, with the 2-foot (0^{m}6) high rock, bearing 062°, distant 7 cables, in a depth of 13 fathoms (23^{m}8).

Dhaulle shoal, reported in 1826 by a schooner of that name, to lie in lat. 9° 32′ N., long. 112° 24′ E., is considered to be identical with one of the neighbouring reefs. In this locality, about 36 miles northward of Central reef, a depth of 1,060 fathoms (1,938^{m}5) was obtained by H.M.S. *Rifleman*, in 1868, while searching for this danger.

Discovery Great reef, most of which dries, and on which are several rocks above water, lies about 54 miles east-north-eastward of Fiery Cross reef. There is a lagoon in the centre which appeared to have no entrance. The reef is steep-to, but H.M.S. *Rifleman*, in 1867, anchored about half a mile off the rocks at the northern end, in a depth of 42 fathoms (76^{m}8).

The Hainan island fishermen, in 1867, reported a reef or shoal lying 10 miles north-eastward of Discovery Great reef, but depths of 40 fathoms (73^{m}2), no bottom, have been found in that locality.

Discovery Small reef, about 10 miles eastward of the southern extremity of Discovery Great reef, is a round coral patch which dries, and is very steep-to.

Western or Flora Temple reef lies about 17 miles west-north-westward of the northern extremity of Discovery Great reef. There are patches of rock, just under water, at the south-western end of Western reef and depths of from one to 3 fathoms (1^{m}8 to 5^{m}5) in other places; it is steep-to and dangerous.

Chart 1201, plan of Tizard bank and reefs.

Tizard bank.—Reefs and islands.—Beacon.—Tizard bank lies about 15 miles north-eastward of Discovery Small reef. It consists of a lagoon bordered by shoals, over which the depths are irregular, and by reefs which dry. There are islands on two of the reefs, and a sand cay on another. In the lagoon are several coral heads with depths of from 3¾ to 7 fathoms (6^{m}9 to 12^{m}8) over them, the positions of which can best be seen on the chart.

Fishermen from Hainan usually visit the islands annually in December and January, and leave again at the commencement of the South-west monsoon.

Itu Aba island (*Lat. 10° 23′ N., Long. 114° 21′ E.*), 8 feet (2^{m}4) high, lies near the north-western end of Tizard bank; the reef surrounding the island extends in some places nearly half a mile offshore, its limits being generally defined by breakers. Itu Aba island is covered with trees and scrub, the tops of which are about 25 feet (7^{m}6) high. There is a concrete landing jetty near the south-western end of the island, with a depth of 2 feet (0^{m}6) at its head. There are several partly demolished buildings and two shallow wells, and near the eastern end of the island is a lookout mast, about 80 feet (24^{m}4) high. There is a stranded wreck off the north-eastern end of the island. In 1951, there were a number of fishermen from Palawan and Hainan on the island, but no permanent inhabitants.

A 2-fathom (3^{m}7) patch lies about 7 cables south-westward of

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Chart 1201, plan of Tizard bank and reefs.

the western extremity of the island, and there is a depth of 3½ fathoms (6m4) about 3½ cables southward of this patch.

A reef, covered at high water, lies about 2 miles eastward of Itu Aba island; near the middle of the channel between them there is a shoal, with a depth of 3½ fathoms (6m4) over it.

A sand cay, with bushes about 15 feet (4m6) high on it, in 1888, lies about 3½ miles eastward of the last mentioned reef, to which it is connected by a ridge, over which the depths are irregular. The sand cay is surrounded by a reef extending about half a mile offshore; on the ridge there is a depth of 5½ fathoms about 2 miles westward of the cay; two 4¾-fathom (8m7) patches lie about 1½ miles west-north-westward of the cay; between these patches and the cay there are several shoals, with depths of from 3¾ to 5½ fathoms (6m9 to 10m1) over them. For anchorage on the ridge, *see* below.

Petley reef lies near the extremity of a ledge of coral which is steep-to and extends about 5 miles from the north-eastern side of Tizard bank. On this ledge there are several shoals, with depths of from 3 to 4¾ fathoms (5m5 to 8m7) over them.

Eldad reef, on which are a few large rocks above water and many other smaller ones, which dry, lies at the eastern end of Tizard bank, about 7 miles south-eastward of Petley reef. The north-eastern end of Eldad reef is narrow and steep-to, and a ridge, on which the depths gradually increase to over 50 fathoms (91m4), extends one mile north-eastward.

Nam yit island, about 20 feet (6m1) high and covered with small trees and bushes, lies on the southern side of Tizard bank, about 11 miles southward of Itu Aba island. It is surrounded by a reef which extends about one mile westward and about 3½ cables in other directions. There is a patch, with a depth of 3 fathoms (5m5) over it, about one mile north-eastward of Nam yit island, and a shoal, with a depth of 2¼ fathoms (4m1) over it, about 2 miles west-south-westward of the island.

Gaven reefs, two in number, about 2½ miles apart in a north-westerly direction, form the south-western end of Tizard bank; the south-eastern reef lies about 6¼ miles westward of Nam yit island. These reefs are covered at high water and between them are some coral heads, one of which, with a depth of 3½ fathoms (6m4) over it, lies about three-quarters of a mile north-westward of the south-eastern reef.

A beacon, the position of which is approximate, marks the north-western of the Gaven reefs (*Lat. 10° 12′ N., Long. 114° 14′ E.*).

Anchorage.—Vessels can anchor with safety on the ridge westward of the reef with a sand cay on it, on the northern side of the lagoon, in depths of from 7 to 10 fathoms (12m8 to 18m3).

In case of necessity and in fine weather, shallow-draught vessels can anchor as convenient almost anywhere on the banks surrounding the lagoon, but care should be exercised to avoid any undiscovered dangers.

In 1951, H.M. Surveying ship *Dampier* anchored in a depth of 10 fathoms (18m3), about 6 cables south-south-eastward of the western end of Itu Aba island. The best approach from seaward to this anchorage is through the deep water channel close to the eastern end of the island.

Charts 2660b, 1263.

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Chart 1201, plan of Loai ta island and reefs.

Loai ta bank.—Islands and reefs.—Loai ta bank is steep-to and consists of a lagoon surrounded by shoals, over which the depths are irregular. On the southern edge of the bank there are reefs, on two of which there are sand cays and, on the southernmost, an island.

Loai ta island (*Lat. 10° 41′ N., Long. 114° 25′ E.*), about 6 feet (1m8) high, covered with mangrove bushes, above which are some coconut palms and bushy trees. The island was deserted in 1933, but there were traces of recent habitation, and also a temporary beacon; it lies at the southern end of Loai ta bank, about 16 miles northward of Tizard bank, and is surrounded by a reef which dries, extending about half a mile from its northern side and a less distance in other directions.

A shoal, with a depth of 3 fathoms (5m5) over it, lies about 2 miles westward of Loai ta island. Two reefs, about one mile apart in a north-easterly direction, lie about 5 miles north-westward of Loai ta island. A shoal, with a depth of 3 fathoms (5m5) over it, lies about three-quarters of a mile eastward of the south-western reef. In the middle of the north-eastern reef, which dries, there was a sand cay, in 1868.

A depth of not less than 4 fathoms (7m3) was found, in 1868, anywhere on the north-western edge of Loai ta bank, north-eastward of the two last mentioned reefs.

A coral patch, which partly dries, lies about 2 miles east-north-eastward of Loai ta island.

Lam kiam cay lies about 6½ miles east-north-eastward of Loai ta island. It is composed of sand, and lies near the middle of a reef which extends nearly half a mile from it, in places. Two coral reefs, which dry, lie, respectively, 3 and 4 miles north-eastward of Lam kiam cay. Depths of 6 fathoms (11m0) and less extend about one mile northward from the latter reef, and a 6-fathom (11m0) patch lies about half a mile northward of the reef situated 3 miles north-eastward of Lam kiam cay.

The eastern edge of Loai ta bank extends about 8½ miles northward from the last-mentioned reef.

Anchorage.—Anchorage may be obtained on Loai ta bank with Loai ta island bearing 260°, distant about 4 cables. In this position the reef is visible.

Chart 1201, plan of Thi tu island and reefs, and Subi reef.

Thi tu island and reefs.—Subi reef, which usually breaks and is apparently steep-to, lies about 21 miles north-westward of Loai ta island. The reef is composed of coral, which dries, and surrounds a lagoon into which there appears to be no passage.

Thi tu island and reefs consist of several dangerous patches upon two coral banks, separated by a narrow and deep channel.

Thi tu (*Lat. 11° 03′ N., Long. 114° 16′ E.*) island, about 11 feet (3m4) high, lies near the eastern end of the westernmost of the above-mentioned banks, about 12½ miles north-eastward of Subi reef. The island is covered with grass and scrub, the top of which is about 60 feet (18m3) high, except at the palm grove at its south-western end. It is surrounded by a drying reef which extends about half a mile from its north-eastern side. Thi tu island was inhabited by 5 Chinese in 1933. The best landing place during the North-east monsoon is in the middle of the western side, where there is an opening in the fringing reef.

Charts 2660b, 1263.

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Chart 1201, plan of Thi tu island and reefs, and Subi reef.

From Thi tu island, the western bank extends about 6 miles westward, with reefs and irregular depths on its edges and greater depths within.

A reef lies about 1½ miles north-westward of Thi tu island; in the channel between there are irregular depths of from 2½ to 8 fathoms (4m6 to 14m6). A reef, which dries and near the middle of which is a sand cay, lies about 1½ miles west-south-westward of the last mentioned reef. In the middle of the passage between the two reefs, leading into the lagoon, there is a detached shoal, with a depth of 5 fathoms (9m1) over it.

A reef, forming the western extremity of the bank, lies about 2 miles west-south-westward of the sand cay, with detached reefs, nearly always marked by breakers, between them.

On the southern edge of the bank is a small reef, lying about 2 miles south-westward of Thi tu island. The southern edge of the western bank is not so dangerous as the northern edge.

The eastern bank is a mass of reefs and shoal patches; its western edge lies about three-quarters of a mile eastward of the reef extending from Thi tu island. From this position, the bank extends about 4½ miles in a north-easterly direction.

Anchorages.—Anchorage may be obtained by shallow-draught vessels on the southern edge of the western bank with the sand cay bearing between 328° and 036°.

Anchorage may also be obtained about one mile south-westward of Thi tu island, in a depth of 10 fathoms (18m3), in which position the reef is visible.

Chart 1201, plan of North Danger.

North Danger.—North Danger, of coral formation, and steep-to, lies about 21 miles northward of Thi tu island. The middle of the formation is remarkably flat and even, having depths of from 22 to 27 fathoms (40m2 to 49m4); it is surrounded by a shallow reef of varying width on which there are many dangers, with depths of less than 5 fathoms (9m1) over them; there are extensive areas of this reef, which dry in patches, at the north-eastern and south-western ends of the formation, and, on its north-western side, there are two islets.

All the known dangers are plainly visible in suitable conditions of light.

The sea on North reef, at the north-eastern end of North Danger, breaks heavily on its north-eastern side during the North-east monsoon.

North-east cay (*Lat. 11° 27′ N., Long. 114° 21′ E.*), 10 feet (3m0) high, lies about 1½ miles west-south-westward of North reef; it is covered with coarse grass, with a fringe of low bushes round the edges; a clump of larger bushes, with a prominent coconut tree, 35 feet (10m7) high, stands near the middle and south-eastern side of the cay. It lies on a reef, which dries, which extends about 6 cables north-eastward from it; between the north-eastern edge of this reef and the western extremity of North reef there is a channel about 9 cables wide, with depths of less than 3 fathoms (5m5), and with a 1¾-fathom (3m2) patch in the middle, but it should not be attempted.

South-west cay, 15 feet (4m6) high and covered with coarse grass, lies about 1¾ miles south-westward of North-east cay, separated by a channel, in which there is a 3-fathom (5m5) patch, situated about 7 cables south-westward of North-east cay, and a 5-fathom (9m1) patch

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Chart 1201, plan of North Danger.

about 4 cables farther south. This islet is a breeding place for sea birds, and is covered with guano, the export of which has, at some time, been carried out on a considerable scale; it is surrounded by a coral reef, which dries in patches, and extends about half a cable from its south-eastern side, and as much as 3 cables in other directions. Landing is possible on the south-eastern side of the islet during the South-west monsoon, even when it is blowing fresh. There are two wells near the centre of the south-eastern side of the islet, and a mast, 40 feet (12m2) high.

A wooden pier, 330 feet (100m6) long, with a depth of one foot (0m3) at its head, extends from the south-eastern side of South-west cay, but, in 1927, it was reported to be in a bad state of repair; it cannot be used during the North-east monsoon.

Jenkins patches, with a least depth of 2¼ fathoms (4m1) over them, lie about one mile south-westward of South-west cay; these patches occasionally break in rough weather.

South reef, at the south-western end of North Danger, breaks heavily on its south-western side during the South-west monsoon.

Sabine patches, with a least depth of 13 feet (4m0) over them, lie at the south-eastern end of North Danger, about 3 miles south-eastward of South-west cay. Farquharson patches, with a least depth of 4 feet (1m2) over them, lie about 6 cables east-north-eastward of Sabine patches.

Day shoal, with a least depth of 9 feet (2m7) over it, lies about 1½ miles southward of the south-eastern end of North reef.

Iroquois ridge extends from North-east cay to Day shoal, and has a least depth of 4½ fathoms (8m2) situated about 1½ miles south-westward of the south-eastern extremity of North reef; between this patch and Day shoal there is a deep channel, about 8 cables wide, and there are openings towards the north-western end of the ridge with greater depths. Between this ridge and North reef there are several patches, with depths of less than 5 fathoms (9m1) over them.

Anchorages.—The bottom within the surrounding reef is composed of sand and coral, and no special anchorages can be recommended. Calm water may be obtained under the lee of North reef during the North-east monsoon, and under the lee of South reef during the South-west monsoon.

Currents.—The currents appear to be mainly seasonal, depending on the prevailing monsoon. In the centre of the formation a rate of half a knot is never exceeded except with a very strong wind. On or near the encircling reef, stronger currents may be expected, up to a maximum rate of a little over a knot; the direction is still mainly with the prevailing wind, but weak currents, against the wind, occur at times for short periods.

Charts 2660b, 2661b.

Shoals eastward of North Danger.—Lys shoal (*Lat. 11° 19′ N., Long. 114° 35′ E.*) lies about 13 miles east-south-eastward of North Danger; it is steep-to and consists of a number of patches, with depths of less than 10 fathoms (18m3) over them, with a lagoon in the centre. A patch, with a depth of 2¾ fathoms (5m0) over it, is situated near the south-western extremity of the shoal and some patches, with a depth of 5 fathoms (9m1) over them, lie near the north-eastern end of the shoal.

Charts 2661a, 1263.

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Charts 2660b, 2661b.

Trident shoal, about 2 miles northward of Lys shoal, is composed of coral and is steep-to; round its edge are many patches, with depths of less than 10 fathoms (18m3) over them, enclosing a lagoon in which the depths are greater. At the northern end of Trident shoal is a patch which is awash; on its eastern side is a patch with a depth of 7 feet (2m1) over it, and on its southern side there is a patch, with a depth of 9 feet (2m7) over it. There is a 2¾-fathom (5m0) patch about 4 miles north-eastward of the 9-foot (2m7) patch, and on the north-western side is a 4-fathom (7m3) patch.

Numerous dangers are reported to lie about 25 miles eastward of Lys and Trident shoals.

Chart 270.

NORTHERN GROUP.—Macclesfield bank.—Macclesfield bank is situated eastward of the main route from Singapore to Hong Kong, its south-western extremity lying about 66 miles east-south-eastward of Bombay reef (page 116). The bank is a submerged atoll with patches, over which there is a depth of less than 10 fathoms (18m3), on the edge.

The shoalest part of the edge is at the north-eastern end of Pigmy shoal, which lies at the north-eastern end of the bank, where there is a depth of 6½ fathoms (11m9).

In the lagoon are several detached shoals, with depths of less than 10 fathoms (18m3) over them, the shoalest being Walker shoal, with a depth of 5 fathoms (9m1) over it, which lies near the centre of the bank.

The chart is the best guide for the depths over the other shoals on the bank. The western portion of the lagoon has only been partially surveyed.

Caution.—Macclesfield bank can generally be seen from aloft. In heavy weather the sea on its edge is high and confused. Vessels are recommended to pass either eastward or westward of the bank as uncharted dangers may exist on it.

Charts 2661a and b.

Helen shoal.—Helen shoal (*Lat. 19° 12′ N., Long. 113° 53′ E.*), on which the sea breaks in bad weather, lies about 15 miles eastward of the main route as indicated on the chart, and about 53 miles south-eastward of St. Esprit shoal (page 120). The least depth over Helen shoal is 6½ fathoms (11m9), with depths of over 100 fathoms (182m9) close round it. Strong tide-rips were observed in the vicinity of Helen shoal, but, on examination, deep water was found to exist there. The current was found to set generally with the wind.

Depths of 26 and 27 fathoms (47m5 and 49m4) were reported, in 1925, to lie about 4 and 9 miles southward, respectively, of Helen shoal.

Discoloured water was reported, in 1923, by s.s. *Kasama* about 57 miles northward of Helen shoal in lat. 20° 09′ N., long. 113° 57′ E.

Chart 2661b.

Dangers north-eastward of Helen shoal.—A description of Pratas reef, which lies about 185 miles north-eastward of Helen shoal, is given in China Sea Pilot, Volumes II and III, and Vereker banks, lying about 157 miles north-eastward of the same shoal, are described in China Sea Pilot, Vol. III.

Chart 1263.

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CHAPTER IV

GULF OF THAILAND

Chart 2414.

WESTERN SHORE OF GULF.—General remarks.—The western shore of the Gulf of Thailand consists of that part of the coast of Trengganu which lies northward of Tanjong Dungun (*Lat. 4° 48′ N., Long. 103° 27′ E.*), the western entrance point of the gulf, the coast of Kelantan, lying north-westward of Trengganu, and the east coast of Thailand, lying farther northward. The country inland consists chiefly of dense forest, and is watered by numerous streams.

The coast of this part of the Malay peninsula is composed of sandy beaches, interspersed with rocky points and, in places, massive headlands.

During the North-east monsoon the working of cargo off the many small ports is frequently impracticable, but during the South-west monsoon the sea is calm.

Tidal streams.—The tidal undulation from the China sea appears to strike the western shore of the gulf somewhere near Hlaem Tachee (page 139). Southward of this point the tidal stream sets southward as the tide rises; northward of it the stream sets northward on a rising tide.

Climate and weather.—*See* page 36.

Chart 3543.

Coast.—Dangers.—Off-lying islet.—Light.—The coast between Tanjong Dungun and Kampong Jambu Bongkok, about 11 miles north-north-westward, is flat, sandy and clear of dangers. Within the coast the land is flat, with many low ranges of hills, and is covered with jungle and scrub. A range of hills, with summits from 800 to 900 feet (243^{m}8 to 274^{m}3) high, lies about 3½ miles inland and terminates in Bukit Laba, 870 feet (265^{m}2) high, situated on the northern bank of Sungei Dungun, about 5 miles westward of Tanjong Dungun. Farther inland higher ranges of mountains may be seen.

Batu Siatin consists of two rocks; the outer one, with a depth of 2 feet (0^{m}6) over it, and steep-to, lies about 19½ miles north-north-westward of Tanjong Dungun and nearly 2 miles offshore; the other rock has a depth of 4 fathoms (7^{m}3) over it, and lies about 2 cables westward of the outer rock.

Chart 998.

Pulau Kapas, 408 feet (124^{m}4) high, and densely wooded, lies about 28 miles north-north-westward of Tanjong Dungun and about 3 miles

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Chart 998.

offshore; foul ground extends a short distance from the south-western side of the islet, and two islets, the eastern of which, named Pulau Kapas Kechil, and 95 feet (29^{m}0) high, lie about one cable off its north-western end.

A light is exhibited, at an elevation of 96 feet (29^{m}3), from a steel structure on the south-western extremity of Pulau Kapas.

A 2½-fathom (4^{m}6) patch lies about one mile westward of the light-structure on Pulau Kapas.

Pulau Kapas is inhabited by fishermen and is reported to afford good anchorage for small vessels with local knowledge during the North-east monsoon.

Chenering head, on the coast, about 5 miles north-westward of Pulau Kapas, is remarkable as being the only rocky point in the neighbourhood. A hill, 816 feet (248^{m}7) high, lies about 2 miles westward of Chenering head.

Batu Burok, a rock which dries 7 feet (2^{m}1), lies a quarter of a mile offshore and 1½ miles south-south-eastward of Kuala Trengganu.

Chart 998, with plan of Kuala Trengganu.

Kuala Trengganu.—Lights.—Buoyage.—Kuala Trengganu is entered between Tanjong Luan, about 5 miles north-westward of Chenering head, and Tanjong Takir, about 2 cables farther north-westward. Bukit Besar, a prominent hill, 485 feet (147^{m}8) high, lies about 2 miles southward of Tanjong Luan; another hill, 100 feet (30^{m}5) high, and wooded, and on which there is a fort and flagstaff, lies about 3½ cables south-westward of the same point, on the southern bank of the river.

Chart 998, plan of Kuala Trengganu.

There is a signal station on Tanjong Takir (*Lat. 5° 21′ N., Long. 103° 09′ E.*).

A bank, with depths of from 2 to 18 feet (0^{m}6 to 5^{m}5) over it, extends about 7 cables from the entrance points, forming a bar, the depths over which are liable to change; in 1948, the least depth on the bar was 4 feet (1^{m}2). The local authorities survey the bar once a year, at the end of the North-east monsoon period. Abreast the town, which stands on the southern bank close inside the entrance, there are depths of from 13 to 15 feet (4^{m}0 to 4^{m}6) in the fairway about 2¼ cables from the southern bank.

There are some rocks, which dry, close off the town. Pulau Duyong Kechil, with Pulau Wan Embong and Pulau Che Long, north-eastward and northward of it, respectively, lie about three-quarters of a mile within the entrance.

A light is exhibited, at an elevation of 114 feet (34^{m}7), from a white brick pillar, on a hill in front of the fort.

Leading light-beacons, which form alignments for the approach and entrance to the harbour, are moved as necessary to meet changes in the channel. The front light of the approach alignment is exhibited from a white wooden framework tower, 20 feet (6^{m}1) in height, surmounted by a diamond daymark, situated nearly 4 cables east-north-eastward of the fort; the rear light is exhibited from a white wooden framework beacon, 30 feet (9^{m}1) in height. In June, 1948, these lights were in line bearing 248°.

The front light of the entrance alignment is exhibited from a white mast with a rectangular topmark, situated on the north-western side

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Chart 998, plan of Kuala Trengganu.

of the harbour, about 4½ cables north-westward of the fort; the rear light is exhibited from a similar structure, about 1½ cables westward of the front light-structure. In 1947, these lights were in line bearing about 269°.

Fairway white conical light-buoy, surmounted by a white spherical cage topmark and exhibiting a *white flashing* light *every five seconds*, is moored outside the bar on the alignment of the approach leading line, about 12 cables east-north-eastward of the fort; vessels may pass on either side of the light-buoy.

Two conical buoys, " C " and " D," are moored inside the harbour on the northern and southern sides, respectively, of the alignment of the entrance leading light-structures; they mark the limit of the shoal water on their respective sides.

Anchorages.—There is good anchorage for small vessels with local knowledge just within the entrance, in a depth of about 3¼ fathoms (5^{m}9). During the North-east monsoon it is often difficult to enter the harbour.

Chart 998.

Anchorage can be obtained, in a depth of 6 fathoms (11^{m}0), sand, with Trengganu main lighthouse bearing about 243°, distant 1½ miles, but it is exposed to winds eastward of south which send in a heavy swell.

Chart 998, plan of Kuala Trengganu.

Trengganu.—There is a landing jetty at the town, which is equipped with two hand cranes, each with a lifting capacity of 2 tons. The jetty is only available at high water for craft drawing not more than 2 feet (0^{m}6); at low water the jetty dries out for a distance of from 6 to 10 feet (1^{m}8 to 3^{m}0).

The Residency, which is not shown on the chart, has a grey roof, and is situated on the coast about one mile southward of the river entrance; there is a flagstaff at the Residency, and some houses northward have prominent red roofs.

Fresh provisions may be obtained. Water may be obtained from wells or from the river.

Climatic table.—*See* page 54.

Communication.—There is regular steamer communication with Singapore.

Kuala Trengganu is connected to the general telephone and telegraph systems.

Chart 998.

Coast.—Light.—Batu Rakit (*Lat. 5° 27′ N., Long. 103° 03′ E.*), a small group of rocks, 2 feet (0^{m}6) high, lies about 8½ miles north-westward of Kuala Trengganu and 2½ cables offshore. Kampong Batu Rakit, where there is a flagstaff, stands on the coast abreast these rocks. This stretch of coast is low, but at Kampong Batu Rakit high land approaches the coast. About 7 miles farther north-westward is Tanjong Merang, 2½ miles southward of which is Bukit Bidong Darat, 670 feet (204^{m}2) high and cone-shaped.

A light is exhibited, at an elevation of 80 feet (24^{m}4), from a framework tower, 30 feet (9^{m}1) in height, on Tanjong Merang.

The coast between Kuala Trengganu and Tanjong Merang is fringed by a bank, with depths of less than 3 fathoms (5^{m}5) over it, extending in places three-quarters of a mile offshore.

Charts 1355, 2414, 2660a, 1263.

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Chart 998.

From Tanjong Merang the coast continues its north-western direction for about 60 miles, to the mouth of Sungei Kelantan, with several off-lying islands and rocks. Sungei Besut discharges about 30 miles north-westward of Tanjong Merang, the boundary between the States of Trengganu and Kelantan, being about 2½ miles north-westward of the river.

The coast is low and bordered by a sandy beach between Tanjong Merang and a position about 25 miles north-westward, where there are two bluffs. At Kampong Payang Stiu, on the coast about 15 miles north-westward of Tanjong Merang, there is a pier; a Custom house and a white flagstaff stand close north-westward of the pier. Kuala Stiu is situated about 4½ miles north-westward of this pier.

A rock, which dries 3 feet (0m9), lies close offshore close westward of Tanjong Merang. About 6½ miles west-north-westward of Tanjong Merang, and close offshore, are some rocks, with depths of less than 6 feet (1m8) over them.

Pulau Rhu, 360 feet (109m7) high to the tops of the trees, lies about 3 miles eastward of the entrance to Sungei Besut and about 1½ miles offshore.

From abreast Pulau Rhu, for a distance of about 20 miles north-westward, the coast is low and sandy and bordered by coconut trees. Along this part of the coast the depths gradually decrease towards the shore.

Off-lying islets and rocks.—Dangers.—A detached shoal, with a depth of 5½ fathoms (9m6) over its north-eastern end, lies about 3½ miles north-north-eastward of Batu Rakit, and a 6-fathom (11m0) patch lies 4½ miles northward of the same rock.

Pulau Yu Kechil, 233 feet (71m0) high, the south-easternmost of the islets lying off this part of the coast, lies about 13 miles east-north-eastward of Tanjong Merang. Pulau Yu Besar, 355 feet (108m2) high, lies about one mile north-north-westward of Pulau Yu Kechil.

Pulau Bidong Laut (*Lat. 5° 37′ N., Long. 103° 04′ E.*), 1,055 feet (321m5) high, lies about 8 miles north-eastward of Tanjong Merang. The island is thickly wooded and has several small bays with sandy beaches on its western and south-western sides. Pulau Karak, thickly wooded, and 215 feet (65m5) high, lies about half a mile southward of Pulau Bidong Laut, with a depth of 11 fathoms (20m1) in the channel between. Pulau Gulup, 350 feet (106m7) high, lies about 1½ miles northward of Pulau Bidong Laut, with Batu Takorak, a smaller islet, 110 feet (33m5) high, about half a mile farther northward. There is another islet, 30 feet (9m1) high, close northward of Batu Takorak.

A group of three rocks, the northernmost of which is Batu Tengah, 2 feet (0m6) high, and the southernmost, Batu Rusa, 9 feet (2m7) high, lie with the latter about 2 miles north-eastward of Tanjong Merang, with a depth of 8 fathoms (14m6) in the channel between.

Batu Barat, 40 feet (12m2) high and partially wooded, lies about 4 miles northward of Batu Tengah. Three isolated rocks, with deep water around, lie about three-quarters of a mile north-westward of Batu Barat; these rocks are one, 7 and 2 feet (0m3, 2m1 and 0m6) high, respectively.

Hafther rock, with a depth of less than 6 feet (1m8) over it, lies about 7 cables south-eastward of Batu Barat.

Charts 1355, 2414.

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Chart 998.

Pulau Redang, 1,249 feet (380m7) high and thickly wooded, lies about 13½ miles northward of Tanjong Merang. The island is moderately steep-to on all sides. There is a bay, on the north-eastern side, the head of which is connected by low land with the head of another bay, forming Pulau Redang harbour, on the southern side, giving the island the appearance of two islands at a distance.

Pulau Lima, 250 feet (76m2) high, lies about one mile eastward of Pulau Redang, with a depth of 14 fathoms (25m6) between.

Pulau Redang harbour, together with the islands and dangers in its approach, is described below.

Pulau Chipu, 78 feet (23m8) high, covered with coarse scrub and prominent, lies about 9 miles west-north-westward of Batu Barat, and about 3½ miles off the coast of Trengganu. The depths round Pulau Chipu are irregular with 3 fathoms (5m5) 4 cables north-westward of it.

Dickson shoal, a small coral patch, with a depth of 7 fathoms (12m8) over it, lies about 3¾ miles east-south-eastward, and Baker shoal, a small coral patch, with a depth of 6 fathoms (11m0) over it, lies about 3¾ miles north-north-westward of Pulau Chipu.

Pulau Lang Tengah (*Lat. 5° 48′ N., Long. 102° 54′ E.*), 520 feet (158m5) high to the tops of the trees, lies about 5 miles westward of Pulau Redang; it is heavily wooded, and cultivated in places. The channel between these two islands is deep and clear.

Pulau Perhentian Besar, 1,134 feet (345m7) high and thickly wooded, is the easternmost island of a group lying about 9 miles north-westward of Pulau Lang Tengah.

Pulau Perhentian Kechil, 1,125 feet (342m9) high, lies close westward of Pulau Perhentian Besar, separated from it by a channel about 2 cables wide in its narrowest part. The channel is impassable except for boats, rocks above water extending about one cable westward from Pulau Perhentian Besar; the latter island is practically uninhabited, but there are some small villages on the southern side of Pulau Perhentian Kechil, which is cultivated in places.

There is good anchorage for small vessels with local knowledge in the southern entrance to the channel between Pulau Perhentian Besar and Pulau Perhentian Kechil, especially during the North-east monsoon.

Seabelle rock, a small coral patch, awash, lies nearly one mile north-north-westward of the south-western extremity of Pulau Perhentian Kechil and about 3 cables offshore. This patch has depths of from 3 to 6 fathoms (5m5 to 11m0) around it.

Pulau Susu Dara, about 710 feet (216m4) high to the tops of the trees, lies about 3½ miles north-westward of Pulau Perhentian Kechil. Pulau Serenggeh, 195 feet (59m4) high, lies nearly one mile southward, and Pulau Rawa, 180 feet (54m9) high, about one mile eastward, of Pulau Susu Dara. There is a group of islets between Pulau Susu Dara and Pulau Rawa, and a rock, 4 feet (1m2) high, lies nearly half a mile west-north-westward of the western extremity of Pulau Susu Dara. The islets near Pulau Susu Dara are mostly steep-to, and the channel between Pulau Perhentian Kechil and Pulau Serenggeh is clear, with depths of about 12 fathoms (21m9) in the fairway.

Chart 998, plan of Pulau Redang harbour.

Pulau Redang harbour.—Islands and dangers in approach.—

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Chart 998, plan of Pulau Redang harbour.

Beacon.—This harbour might be useful to a small vessel in case of distress, being easy of access.

Pulau Koringo Besar and Pulau Koringo Kechil lie about 3½ cables off the south-eastern side of Pulau Redang, and on the northern side of the eastern approach to Pulau Redang harbour. Pulau Koringo Besar is 50 feet (15m2) high and partly wooded, and, in the middle of the western side, there is a remarkably balanced boulder. Pulau Koringo Kechil, bare and rocky, is 34 feet (10m4) high, and lies 1¼ cables north-north-eastward of the former, to which it is joined by foul ground.

Pulau Ekor Tibu, 170 feet (51m8) high and wooded, lies about three-quarters of a mile southward of Pulau Koringo Besar, and on the southern side of the eastern approach to the harbour.

Pulau Chipor, 35 feet (10m7) high, and rocky, lies about half a mile west-south-westward of Pulau Ekor Tibu. A shoal, with a depth of 40 feet (12m2) over it and steep-to, lies 3 cables southward of Pulau Chipor. Batu Chipor, a round-topped rock, which dries 6 feet (1m8), lies about 1½ cables northward of Pulau Chipor (*Lat. 5° 44′ N., Long. 103° 01′ E.*).

Pulau Penang, 450 feet (137m2) high, is separated from the south-western extremity of Pulau Redang by a channel about one cable wide, in which there are depths of from 34 to 52 feet (10m4 to 15m8). A coral bank, which dries, extends from one to 1½ cables from the northern extremity and north-eastern sides of the island, and on it are two islets, 25 and 15 feet (7m6 and 4m6) high, lying about 3½ cables south-eastward and three-quarters of a cable northward, respectively, of the northern extremity of the island. There is a narrow channel marked by a small beacon at its outer end, available for boats leading to Kampong Penang, situated close within the northern extremity of the island. The chief occupations of the inhabitants of the village are coconut cultivation and the drying of fish for export.

A shoal, with a depth of 17 feet (5m2) over it, lies in mid-channel about 2¾ cables east-north-eastward of the northern extremity of Pulau Penang.

Connell rock, a coral patch, with a depth of 16 feet (4m9) over it, lies about 2¼ cables eastward of the eastern extremity of Pulau Penang.

Anchorages.—Directions.—There is good anchorage, with swinging room of about 1½ cables, for small vessels in the north-western part of Pulau Redang harbour, in depths of from 4 to 5 fathoms (7m3 to 9m1), sand. Larger vessels may anchor in the eastern approach to the harbour, in a depth of 10 fathoms (18m3), sand and coral, with swinging room of about 3 cables.

The passage northward of Pulau Penang is dangerous when the tidal stream is running strongly, and should not be used without local knowledge. Vessels proceeding to the anchorages are recommended to approach from eastward and to pass between Pulau Ekor Tibu and Pulau Koringo Besar.

Chart 998.

Coast.—Beacons.—Lights.—The entrance to Sungei Besut (page 133) can be identified by two leading beacons each surmounted by a triangle, on its northern side, and by a flagstaff on its southern side; it is about one cable wide, and is closed by a bar, with depths of less than 6 feet (1m8) over it, which is liable to shift its position according

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Chart 998.

to the monsoon; it is impassable, even for boats, without local knowledge. The beacons, in line, bearing 241°, lead across the bar.

A light is exhibited, at an elevation of 19 feet (5m8), from a wooden structure, at Kuala Besut.

A small village is situated on the western side of the mouth of Sungei Besut; and there are some buildings and a jetty on the opposite bank.

An Assistant British Adviser resides at Kampong Raja, about 2 miles inland of Kuala Besut. Kampong Raja is connected to the telegraph system.

Kuala Semerak, near which there is a signal station and flagstaff, is situated in the State of Kelantan, about 3½ miles north-westward of Kuala Besut; the entrance is about 2 cables wide and is closed by a bar. Sungei Semerak is tortuous up to Pasir Puteh, a small town, situated about 6 miles inland.

A light is exhibited on the northern side of the entrance to Sungei Semerak, at an elevation of 40 feet (12m2), from a white wooden framework tower with a white rectangular daymark.

Bachok, a small town, is situated on the coast about 14 miles north-westward of Kuala Semerak.

A light is exhibited in Bachok, at an elevation of 40 feet (12m2), from a white wooden framework tower with a white rectangular daymark.

Bukit Gunong, about 400 feet (121m9) high, lies about 6½ miles south-south-westward of Bachok; Bukit Marak, 368 feet (112m2) high, lies about 4 miles north-north-westward of Bukit Gunong.

Chart 1376.

The village of Sabak is situated 7½ miles north-westward of Bachok, thence the coast curves west-north-westward for about 6 miles to Kuala Besar, the principal mouth of Sungei Kelantan.

A light is exhibited, at an elevation of 40 feet (12m2), from a white wooden framework tower with a white rectangular daymark at Sabak (*Lat. 6° 11′ N., Long. 102° 20′ E.*).

Chart 998.

Anchorages.—There is anchorage for small vessels with local knowledge during the South-west monsoon, about half a mile offshore, at Kuala Besut and Kuala Semerak; the holding ground of black mud is good. There is also anchorage off Bachok, in a depth of 3 fathoms (5m5), sand and shell. During the North-east monsoon, owing to heavy seas, communication with the shore becomes difficult, but during the South-west monsoon there is regular steamer communication with Singapore and Bangkok from Kuala Semerak and Bachok. Kuala Besut is connected to the general telegraph system.

Outlying bank.—Churchill patches, with a least depth of 7½ fathoms (13m7) over them, sand and shell, with depths of from 14 to 16 fathoms (25m6 to 29m3) around them, lie about 14 miles eastward of the light-structure at Bachok.

Charts 1376, 998.

Coast.—Dangers.—The coast from Sabak to Tabal, 14½ miles west-north-westward, is low and featureless and backed by numerous lagoons and waterways which form the delta of Sungei Kelantan. The only objects which may easily be identified are Bukit Marak, Bukit Menunggal, 1,676 feet (510m9) high, about 15 miles south-south-westward of Bachok; Bukit Panau, 761 feet (232m0) high,

Chart 2414.

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Charts 1376, 998.

about 6 miles west-north-westward of Bukit Menunggal; and Tumpat lighthouse.

Chart 1376.

Kuala Besar, the eastern of the two main entrances to Sungei Kelantan, lies about 6 miles west-north-westward of Sabak, and discoloured water may be encountered several miles seaward of this entrance. Kuala Tongkong, the other main entrance, lies about 4 miles farther westward. The mouths of the delta are continuously changing, both in depth and direction, and are sometimes blocked altogether.

A narrow bank, with depths of from 2 to 5 feet (0^m6 to 1^m5) over it, extends about $3\frac{1}{4}$ miles, parallel with the coast off Sabak and from about one to 3 cables offshore. Between this bank and the coast there are depths of from 8 to 11 feet (3^m0). Landing in this vicinity is inadvisable except at high water. Kota Bharu, the largest town and seat of the Government in the State of Kelantan, is situated about 5 miles southward of Kuala Besar.

Kuala Besar has a detached sandspit, which dries from one to 2 feet (0^m3 to 0^m6), in the middle of its entrance. A boat channel across the bar runs close eastward of the sandspit, the bar being continuous to the coast on the western side of it.

Tumpat.—Light.—Tumpat, the principal port of Kelantan, stands on the southern side of the entrance to Kuala Tongkong. It is sheltered from seaward by a sandspit, but anchorage inside the spit is only suitable for small craft. The river is navigable for barges between Tumpat and Kota Bharu at high water. There are two wooden piers at Tumpat, with depths of about 2 feet (0^m6) alongside.

A light is exhibited, at an elevation of 63 feet (19^m2), from a white circular masonry tower at Tumpat (*Lat. 6° 12′ N., Long. 102° 10′ E.*). *See* view facing page 60.

Buoyage.—A cylindrical light-buoy, painted green, exhibiting a *white flashing* light *every five seconds*, marks a wreck with masts above water, about $2\frac{1}{2}$ miles north-north-westward of Tumpat lighthouse.

A white buoy, marking the anchorage for small vessels, is moored about $1\frac{1}{2}$ miles north-westward of Tumpat lighthouse.

Current.—Tidal streams.—During the North-east monsoon when the river is in flood there is a strong current in the river, and off its mouth there is a south-going current with a rate of from 2 to $2\frac{1}{2}$ knots. During the South-west monsoon the offshore current sets northward at a slightly less rate. The tidal streams are very weak.

Trade.—The principal exports are rubber, betelnuts, copra, tin and silver; gold, livestock, and other agricultural products are also exported.

Communication.—Tumpat is the terminus of a branch line which connects with Bangkok and Singapore.

Anchorage.—Directions.—Small vessels may obtain anchorage, in a depth of about $3\frac{1}{2}$ fathoms (6^m4), soft mud, about 2 miles north-north-westward of Tumpat lighthouse. Large vessels may anchor farther offshore; the holding ground is bad. Fishing stakes may be encountered up to 6 miles from this coast.

Vessels proceeding to Tumpat from south-eastward should keep

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Chart 1376.

about 2½ miles from the coast until Tumpat lighthouse bears 180°, when they may steer for the anchorage.

Chart 998.

Coast.—Lights.—Beacon.—About 8 miles west-north-westward of Tumpat is Kuala Golok. Takbai village stands in Thailand, on the left bank of Sungei Golok, just inside the entrance. There is regular steamer communication between Takbai and Singapore.

A conical hill, 1,158 feet (352m9) high and covered with trees, lies a short distance inland, about 14 miles north-westward of Kuala Golok, the coast between them being low. There is a prominent hill, covered with trees, situated about 3½ miles southward of the conical hill.

The entrance to Narativas river is situated about 3 miles north-westward of the conical hill. A shifting sandbank extends about one mile east-north-eastward from the southern entrance point of the river, and the entrance itself is obstructed by a bar, with a depth of 3 feet (0m9) over it. The position of the navigable channel is subject to change. A mudbank extends from the right bank within the entrance, nearly half way across the river, leaving a channel close to the left bank.

Narativas village is situated on the left bank of the river above the mudbank, about half a mile from the entrance.

A light is exhibited, at an elevation of 95 feet (29m0), from a white iron framework structure, 92 feet (28m0) in height, at Narativas.

There is regular steamer communication between Narativas, Bangkok and Singapore. A few supplies can be obtained at the village.

Batu Rakit (Baltu Rakil) (*Lat. 6° 40′ N., Long. 101° 44′ E.*), a white rock, 39 feet (11m9) high and steep-to, lies about 15 miles north-north-westward of Narativas and about 3½ miles offshore.

A red beacon, surmounted by a steel tripod, stands on Batu Rakit.

The entrance to Saiburi river is situated about 20 miles north-westward of Narativas. An isolated clump of trees stood, in 1907, northward of the entrance. The entrance to the river is obstructed by a shifting bar, over which, at times, there are depths of from 2 to 3 feet (0m6 to 0m9). Saiburi village stands about 1½ miles within the entrance.

A light is exhibited, at an elevation of 92 feet (28m0), from a white iron framework structure 85 feet (25m9) in height, situated on the northern side of the entrance to Saiburi river.

There is regular steamer communication between Saiburi, Bangkok and Singapore. A few supplies can be obtained at the village.

Hilly cape, about 10 miles north-north-westward of Saiburi, consists of two remarkable steep bluffs, about 2 miles apart, which form the northern end of a range of mountains.

The coast between the conical hill, mentioned above, and Hilly cape is low, and a bank, with depths of less than 3 fathoms (5m5) over it, extends nearly 1½ miles off it in places.

A range of mountains lies about 8 miles inland; Khao Bodo, the summit, at the northern end of the range and about 9 miles south-south-westward of Saiburi, attains an elevation of 2,643 feet (805m6); there is a sharp peak at the southern end of this range.

A chain of mountains extends south-south-westward from Hilly cape; the summit, Khao Kuan (Bukit Tuna), 1,636 feet (498m6) high,

Chart 2414.

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Chart 998.

lies about 7 miles south-south-westward of the cape, and Table range, 1,304 feet (397m5) high, about 2 miles farther southward.

Anchorages.—Directions.—Good anchorage may be obtained by small vessels with local knowledge off Narativas village, in a depth of 2½ fathoms (4m6), mud.

Anchorage can be obtained outside the mouth of Saiburi river, about three-quarters of a mile offshore, in a depth of 3 fathoms (5m5), blue mud. This anchorage should be approached with the clump of high trees bearing 294°. Approaching from northward, a vessel should keep at least 1½ miles offshore. During the North-east monsoon a heavy surf prevents the working of cargo.

Outlying islet.—Pulau Lozin (*Lat. 7° 21′ N., Long. 102° 00′ E.*), 7 feet (2m1) high and steep-to all round, lies about 40 miles north-eastward of Hilly cape.

Chart 998, plan of Patani roads.

Patani roads.—Dangers.—Light.—About 10 miles west-north-westward of Hilly cape, a low narrow sandy spit, thickly covered with pine trees, extends about 6 miles west-north-westward from the coast to Hlaem Tachee (Tanjong Patani).

A light is exhibited, at an elevation of 102 feet (31m1), from a white iron framework tower, 96 feet (29m3) in height, on Hlaem Tachee.

Beating China shoal, with a least depth of 1¾ fathoms (3m2) over it, lies about 5 miles east-north-eastward of Hlaem Tachee.

Loftus bank, consisting of hard sand, with depths, of from 1¼ to 3 fathoms (2m3 to 5m5) over it, lies parallel with, and about one mile from, the above mentioned spit; in the fairway of the channel between the spit and Loftus bank, there are patches, with depths of from 1¼ to 3 fathoms (2m3 to 5m5) over them, with rather greater depths, mud, around.

Several detached shoals, with depths of 4¾ and 5 fathoms (8m7 and 9m1) over them, lie within 6 miles north-westward of Hlaem Tachee, and a shoal, with a least depth of 2¾ fathoms (5m0) over it, lies 3 miles westward of the same point.

Enemy Chaser patch, with a least depth of 1¼ fathoms (2m3) over it, lies about 10 miles west-south-westward of Hlaem Tachee and about 3 miles offshore. Lew Tale, a shoal, with a depth of less than 6 feet (1m8) over it, lies about 7 miles south-westward of Hlaem Tachee and 7 cables offshore. A shallow bay, which dries in places, is entered between Hlaem Tachee and the mouth of the Patani river, about 3 miles southward. On the western side of the entrance to the river there is a flagstaff, a Custom house and a pier.

The town of Patani stands on both banks of the Patani river, about one mile southward of the mouth. The population, in 1937, was 23,082.

Tidal streams.—The tidal streams off Hlaem Tachee set eastward and westward; the west-going tidal stream attains a rate of from 2 to 3 knots. Along the coast between Patani roads and Singora the flow is westward and north-westward when the tide at Singora is rising, and in the opposite direction when it is falling. Rates in either direction are up to 2 to 3 knots.

Anchorage.—Patani roads, about 4 miles westward of Hlaem Tachee (*Lat. 6° 57′ N., Long. 101° 18′ E.*), affords anchorage to small vessels with local knowledge, in depths of from 3 to 5 fathoms (5m5

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Chart 998, plan of Patani roads.

to 9m1), mud. Anchorage for smaller craft is indicated on the chart about 2 miles south-westward of Hlaem Tachee, and the high tree, bearing 137°, situated on the eastern side of the river entrance, forms a useful mark, but when approaching the anchorage the 2¾-fathom (5m0) shoal westward of Hlaem Tachee should be avoided. During the South-west monsoon the anchorage is subject to frequent squalls from the north-west, especially by night about the period of spring tides, and vessels are liable to drag their anchors.

Communication.—There is occasional steamer communication between Patani, Singapore and Bangkok.

Chart 998.

Coast.—Danger.—Kampong Tibu is situated about 18 miles westward of the mouth of Patani river, the coast between them being low. About 10 miles north-westward of Kampong Tibu there is a projection in the coast, close westward of which Sungei Sokong discharges into a small bay. The projection is the termination of a ridge of hills which extends about 6 miles south-eastward from it, almost parallel with the coast.

Khao Roug Prig (Table top), 728 feet (221m9) high, lies about 1½ miles southward of the mouth of Sungei Sokong.

Ko Kam (Pulo Chelaji), 133 feet (40m5) high, closely surrounded by rocks, with a depth of less than 6 feet (1m8) over them, lies about half a mile north-eastward of the above-mentioned projection.

Between the entrance to Sungei Sokong and Hlaem Kau Rong, about 19 miles north-westward, the coast is low, a bank, with depths of less than 5 fathoms (9m1) over it, extending nearly 3 miles offshore.

A range of mountains, 1,175 feet (358m1) high near its northern end and 2,031 feet (619m0) high near its southern end, extends about 16 miles southward from Hlaem Kau Rong.

Hlaem Sai, the eastern entrance point of Singora harbour, lies about 4 miles north-westward of Hlaem Kau Rong.

Chart 998, plan of Songkhla roads.

Singora harbour and approach.—Islets and dangers.—Light.—Singora (Songkhla) harbour is entered between Hlaem Sai and Hua Khao Dang, about 2 cables south-westward.

Ko Nu (Koh Gnu), 278 feet (84m7) high, the largest islet, lies about 1½ miles east-north-eastward of Hlaem Sai. Hin Luk Meo Nok (Lukmu Nok), 5 feet (1m5) high, lies about 6 cables farther north-eastward. Ko Meo (Koh Mu), 147 feet (44m8) high, lies about 1½ miles north-north-westward of Ko Nu. Hin Luk Meo Nai (Lukmu Nai), 12 feet (3m7) high, lies about 4 cables southward of Ko Meo. A 17-foot (5m2) patch lies about 6 cables north-north-westward of the eastern extremity of Ko Meo.

Between Hlaem Sai (*Lat. 7° 14′ N., Long. 100° 35′ E.*) and Hlaem Simila, about 1½ miles south-eastward, there is a shallow bight in the coast. Two patches of rock, of which the outer, Luk Hin Simila, dries, and the inner, Hin Simila, is one foot (0m3) high, extend about 4½ cables from Hlaem Simila. A spit, patches of which dry, extends about 2 miles north-westward from Hlaem Sai, leaving a narrow channel, with a depth of 7 feet (2m1) in the fairway between it and the coast. The depths in the channel, and its direction, are continually changing, partly owing to the heavy breakers experienced during the

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Chart 998, plan of Songkhla roads.

North-east monsoon. The depths in the channel are greater as the entrance to the harbour is approached.

A light is exhibited, at an elevation of 350 feet (106^{m}7), from a white masonry tower, 45 feet (13^{m}7) in height, about 1¼ miles south-south-eastward of Hlaem Sai.

The western side of the harbour is hilly. Khao Dang (Deng) Yai, 587 feet (178^{m}9) high, with two pagodas near its north-eastern end, is the summit of a range extending southward from Hua Khao Dang and Khao Dang (Deng) Lek, 544 feet (165^{m}8) high, lies about half a mile farther southward. The suburbs of the town are built along the western shore. Rocks extend about one cable offshore in places from the western side of the harbour.

Hlaem Son lies on the western side of the harbour about 1¾ miles southward of Hua Khao Dang; a bank, with depths of less than 6 feet (1^{m}8) over it, extends about 2½ cables from the point. Khao Tang Kuan, on the eastern side of the harbour, and on which the lighthouse stands, is about 307 feet (93^{m}6) high; a prominent white pagoda stands close to the lighthouse.

A shoal, with a depth of less than 6 feet (1^{m}8) over it, and which is frequently changing in form, lies nearly midway between the two sides of the harbour, abreast Khao Tang Kuan, leaving a narrow channel, in the fairway of which are depths of from 12 to 18 feet (3^{m}7 to 5^{m}5), close to the eastern side.

Entry into the inner harbour is restricted to shallow draught vessels and boats only, during neap tides; spring tides permit the entry of vessels with a draught of up to about 12 feet (3^{m}7).

Singora, also known as Songkhla, the capital of the province of Nagorn Sridharmraj (page 145), is situated at the southern end of the eastern side of the harbour, about 2 miles within the entrance. Southward of the town there is a commercial quarter, in the vicinity of which are some foreign consulates; in 1937, the population of the town was 95,179.

Products.—The principal products are tin and other metallic ores, rubber, rice, fish, hides and horns.

Communication.—Singora is the terminus of a branch line connected with the main Thai and Federated Malay States railways.

There is regular steamer communication with Bangkok and Singapore, and other ports along the coast.

An airfield, from which international air-lines operate throughout the year, is situated in the vicinity of the town.

Consul.—There is a Consular officer at Singora.

Anchorages.—Directions.—During the North-east monsoon, small vessels with local knowledge may anchor about a quarter of a mile south-westward of Ko Nu, in a depth of 16 feet (4^{m}9), mud. During the South-west monsoon, they can anchor nearer the shore, about half a mile southward of the same islet.

The usual anchorage lies westward of Ko Meo, where there are depths of about 20 feet (6^{m}1).

Large vessels should anchor eastward of Ko Nu (*Lat. 7° 14′ N., Long. 100° 36′ E.*), in depths of from 5 to 6 fathoms (9^{m}1 to 11^{m}0).

No vessel should attempt to enter the harbour without local knowledge.

Tidal streams.—While the tide is rising inside the harbour, the

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Chart 998, plan of Songkhla roads.

tidal stream sets north-westward along the coast outside the harbour, and in the opposite direction when it is falling.

Chart 998.

Coast.—Light.—An inland sea, entered through a channel, which is occasionally buoyed, from Singora harbour, extends about 40 miles north-westward, being separated from the China sea by a low sandy ridge. The inland sea is navigable by small craft, drawing about 9 feet (2^{m}7), in its southern part; its northern part is shallow, and Patalung, a town on its western side, about 38 miles north-westward of Singora, can only be reached from it by boats. At its northern end, the inland sea is reported to be connected with Ao Nakhaun (*see* below), by a channel, navigable by boats drawing 2 feet (0^{m}6).

The coast from Singora to Hlaem Talum Phuk (Kolam Puk), about 80 miles north-north-westward, is low and sandy, with trees in places; the inland sea, mentioned above, discharges through the coast by the Klong Rawah (Ra), about 43 miles from Singora, and by Klong Park Tras, a few miles southward of Klong Rawah. There are a few small villages on the coast. The bottom offshore consists of mud, and there are no known dangers close to the coast.

Charts 989, 998.

Hlaem Talum Phuk is a narrow curved spit of coarse sand, with a group of trees on its extremity.

A light is exhibited, at an elevation of 98 feet (29^{m}9), from a white iron framework structure, situated about 3¼ miles south-eastward of the extremity of Hlaem Talum Phuk.

Chart 998.

Outlying islet.—Ko Krah, 530 feet (161^{m}5) high, lies about 35 miles eastward of Hlaem Talum Phuk. A rock, 265 feet (80^{m}8) high, with another rock, 152 feet (46^{m}3) high, close westward, lies about 1¼ miles south-south-eastward of Ko Krah. A smaller rock, 4 feet (1^{m}2) high, lies about one mile south-westward of the last-mentioned rocks.

Charts 989, 998.

Lakon roads.—Light.—Lakon roads, in which the depths are from 4 to 5 fathoms (7^{m}3 to 9^{m}1), but were reported, in 1898, to be decreasing, lie about 7 miles north-westward of Hlaem Talum Phuk, outside Ao Nakhaun (Lakon bight), which is entered between the latter and the mouth of the Pak Phaya (Pakpoon river), about 9 miles westward.

Hlaem Kolam spit, with a depth of less than 6 feet (1^{m}8) over it, extends about 3½ miles north-westward from Hlaem Talum Phuk, and a bank, with depths of less than 3 fathoms (5^{m}5) over it, extends another 2 miles in the same direction and also about 2 miles north-eastward from the mouth of Pak Phaya, where there are some fishing stakes. Small vessels with local knowledge could, in 1934, enter Pak Phaya and reach Ta Pae, about 4 miles from the mouth.

Nakhaun (Nakorn) light is exhibited, at an elevation of 89 feet (27^{m}1), from a white iron framework structure, 89 feet (27^{m}1) in height, on the south-eastern side of the entrance to Pak Phaya (*Lat. 8° 29′ N., Long. 100° 00′ E.*).

The entrance to Pak Nakhaun (Lakon river) lies about 2¼ miles south-eastward of that of Pak Phaya.

Inside the entrance points, Ao Nakhaun is shallow and only navigable by boats at or near high water; at its head is Klong Pakin-

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Charts 989, 998.

ang, which is reported to lead to the inland sea, described above; the village of Pak Bhanang, situated about one mile above the mouth of Klong Pakinang, is accessible to vessels of 7 feet (2m1) draught.

Nagorn Sridharmraj (Lakon) is situated about 5 miles south-westward of the mouth of Pak Nakhaun; the river can only be navigated by boats.

Anchorage.—Directions.—Anchorage may be obtained in Lakon roads during the South-west monsoon about 5 miles northward of the entrance to Pak Nakhaun, in a depth of about 4 fathoms (7m3).

Small vessels bound to Lakon roads from southward should round Hlaem Talum Phuk at a distance of not less than 5 miles.

Communication.—Nagorn Sridharmraj is connected with the main Thai and Federated Malay States railways.

There is regular steamer communication with Singapore and Bangkok.

Chart 989.

Tidal streams.—About 8 miles off the stretch of coast northward of Lakon the flow on the rising tide is north-westerly to northerly, attaining 2½ to 3 knots off Klong Bahkla, situated 16 miles northward of Nakhaun light-structure (page 142), and 3¼ knots off Hlaem Ple Dam, 18 miles farther northward. This flow turns into Lakon roads, where it takes a south-westerly direction, with a rate up to 2½ or 3 knots; the flow on a falling tide sets in the opposite direction.

Coast.—Between the mouth of Pak Nakhaun and Hlaem Kwang, 489 feet (149m0) high, about 30 miles northward, the coast is low; several small streams with villages near them discharge through this stretch of coast. The depths gradually decrease towards the mud-bank, with depths of less than 3 fathoms (5m5) over it, which extends from about half a mile to 2 miles offshore.

From Khao Luang (Kau Lu Ong), 5,814 feet (1,772m1) high, situated about 16 miles westward of the mouth of Pak Nakhaun, a range of mountains extends about 12½ miles northward. Needle peak, 5,274 feet (1,607m5) high and conspicuous, lies about 3¼ miles northward of Khao Luang, and Sharp Cone, 2,594 feet (790m7) high, and prominent, lies at the northern end of the range. About 7 miles north-north-eastward of Sharp Cone is Khao Prong, 4,480 feet (1,365m5) high, the highest peak of another range of mountains lying about 10 miles inland.

A rock, with a depth of 3½ feet (1m0) over it, was reported, in 1925, to lie about 1¼ miles northward of Hlaem Kwang, and about 1½ miles offshore, and a rock, awash, lies about half a mile northward of the same point. A rock, with a depth of less than 6 feet (1m8) over it, lies about three-quarters of a mile north-eastward of the point, but its position is approximate.

The coast between Hlaem Kwang and Hlaem Ple Dam (*Lat. 9° 03′ N., Long. 99° 56′ E.*), about 5 miles northward, should be given a wide berth. A rock, with a depth of 2 feet (0m6) over it, was reported previous to 1888, to lie 1¼ miles eastward of Hlaem Ple Dam, but its position is doubtful. A hill, 708 feet (215m8) high, lies about 1¼ miles westward of Hlaem Ple Dam, and Khao Kwang, 2,670 feet (813m8) high, lies about 2½ miles farther westward.

Devils point, which is conspicuous, lies about 8 miles northward of

Chart 2414.

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Chart 989.

Hlaem Ple Dam; it consists of five peaks, known as the Five Devils, one of which is 796 feet (242m6) high. Samui strait is situated between Devils point and the islands north-eastward of it. Khao Pra Nom, 1,805 feet (550m2) high, lies about 10½ miles west-south-westward of Devils point. Hlaem Chisu, with Khao Chaison (Chisu), 1,736 feet (529m2) high, about 1½ miles south-westward of it, lies about 2½ miles north-westward of Devils point. Kwie, 1,218 feet (371m2) high, lies 6 miles westward of Hlaem Chisu.

North-east point, 625 feet (190m5) high, lies about 4 miles north-north-westward of Hlaem Chisu. About 3½ miles westward of North-east point is Ko Pea, which lies close offshore, and about 1¾ miles farther westward is Hlaem Gelah. Thence to Hlaem Tuet, about 3¼ miles westward, there is a shallow bay, with an islet in its western part lying about half a mile offshore. High rock, 313 feet (95m4) high, lies about 2 miles north-westward of Hlaem Gelah.

Off the coast between Devils point and Hlaem Tuet a number of islands and dangers, with channels between them, extends about 50 miles northward.

Samui strait.—Islands and dangers.—Light.—West channel, the best passage through the strait, lies between North-east point and Ko Wang Nai (West island), about 3¾ miles eastward. Ko Wang Nai is 236 feet (71m9) high, and fringed by rocks.

A light is exhibited, at an elevation of 265 feet (80m8), from a white iron framework structure, 30 feet (9m1) in height, on Ko Wang Nai.

Ko Wang Nauk (Goh Kwang), 231 feet (70m4) high, and fringed with rocks, lies about three-quarters of a mile eastward of Ko Wang Nai. A rock, above water, lies nearly half a mile south-eastward of Ko Wang Nauk.

Ko Rap, which is low and fringed with rocks, lies nearly in the middle of the entrance to the strait, about 2 miles eastward of Ko Wang Nauk. A bank, on which there are two rocks above water, extends about 2 cables southward from the southern extremity of Ko Rap.

White rock, above water, with rocks awash, lying within 1½ cables of it, lies about 1¼ miles north-eastward of Ko Wang Nauk. Smith islet lies about three-quarters of a mile northward of White rock.

In the north-eastern approach to Samui strait, reefs extend, in places, for a short distance off the south-eastern side of Ko Samui, between Hlaem Konan, about 12½ miles north-eastward of Ko Rap, and Hlaem Koset, about 5 miles south-westward. Hlaem Sau, the southern extremity of Ko Samui, lies about 2¾ miles west-south-westward of Hlaem Koset.

Between Hlaem Sau and Hlaem Hin Khom, about 2¼ miles westward, there is a bight in the coast, from the head of which a bank, with depths of less than 2 fathoms (3m7) over it, extends over one mile, leaving a narrow passage, only navigable by small craft with local knowledge, between it and Ko Katen. A detached shoal, with a depth of 5 fathoms (9m1) over it, lies about 1¼ miles southward of Hlaem Hin Khom (*Lat. 9° 23′ N., Long. 99° 56′ E.*).

An Koh Wan, 6 feet (1m8) high, lies on the eastern end of a detached reef, about 2 miles southward of Hlaem Koset.

Ko Katen (Kahten), 670 feet (204m2) high, and fringed by reefs, lies nearly midway between Hlaem Sau and Smith islet. A rock,

Chart 2414.

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Chart 989.

above water, lies close off its south-western end, and a spit, with a depth of one fathom (1m8) over it, extends about one mile south-eastward from its northern extremity. Mat Sum, an islet, lies about one mile eastward of Ko Katen, with a 2¼-fathom (4m1) patch between them. Between Mat Sum and Ko Samui are several rocks, above water, and other dangers.

Samui strait leads into the southern end of Middle passage (page 146).

Tidal streams.—The north-going tidal stream runs with considerable force through Samui strait, attaining a rate of 3¼ knots in its approach.

On the rising tide, the flow sets northward in the southern approaches to the strait, attaining a rate of 3¼ knots. It divides, one part setting north-westward through the strait, and another part which continues northward past the eastern side of Ko Samui. The former branch, after passing through the strait, flows northward past Ko Samui and into Middle passage. At the same time off-shoots flow westward through the channels between the islands north of Hlaem Tuet, which lead towards Ao Bandon. The latter branch passes Ko Phangan and turns north-westward into Tau passage, then south-westerly about 10 miles eastward of Loftus shoal (page 149); close inshore southward of this shoal, it sets southward into Ao Bandon.

Ko Samui.—Ko Samui is part of the province of Nagorn Sridharmraj. Its summit, Khao Yai (Kau Yie), 2,084 feet (635m2) high, lies about 5½ miles west-north-westward of Hlaem Konan. The island is covered with dense forest, and has several villages. On the eastern side between Hlaem Konan and Hlaem Tong Kean, 6 miles northward, there is a bight, in which there is an islet, with rocks between it and the coast, lying close offshore, about 2 miles southward of Hlaem Tong Kean.

There is regular steamer communication between Ko Samui, and Singapore and Bangkok.

For anchorage, *see* page 148.

Pennan channel.—Pennan channel is entered from eastward between Hlaem Tong Kean and South-east point, the south-eastern extremity of Ko Pha-ngan (Pennan) about 6 miles northward.

On the southern side of the channel, a peninsula, forming the north-eastern end of Ko Samui, extends about 2 miles northward from Hlaem Tong Kean. Some rocks, one of which is above water, and others awash, lie close north-eastward of this peninsula, and Tong Krok, 83 feet (25m3) high, with a rock, awash, close westward, and a rock, above water, close southward, lies about 1¼ miles north-eastward of the peninsula. White rock lies about 1¾ miles westward of the northern end of the peninsula, with Red islet (*Lat. 9° 34′ N., Long. 100° 04′ E.*) and other rocks between.

Hlaem Hoi lies about 5½ miles westward of the peninsula. Hlaem Hoi bank, with a depth of one fathom (1m8) over it, lies on the edge of the coastal bank about 1¼ miles north-eastward of Hlaem Hoi. A bank, with depths of less than 5 fathoms (9m1) over it, extends about 2¼ miles from this coast.

Hlaem Yei, the north-western extremity of Ko Samui, lies about 4 miles west-south-westward of Hlaem Hoi; the coast between is fringed with rocks, and a bank, with depths of less than 5 fathoms (9m1) over it, extends about 2 miles offshore.

Chart 2414.

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Chart 989.

On the northern side of Pennan channel, Table rock, 10 feet (3m0) high, lies close southward of South-east point. The south-western side of Ko Pha-ngan, between South-east point and Ban Khao, about 7 miles north-westward, is fringed by a reef which extends nearly one mile offshore from a point about 1½ miles south-south-eastward of Ban Khao.

Ko Tao (Tau), 397 feet (121m0) high, lies about 1¾ miles south-westward of Ban Khao; Ko Kong Kliang (Klian), 80 feet (24m4) high, two rocks close together, lies about 2¾ miles north-westward of Ban Khao.

Ko Pha-ngan.—Ko Pha-ngan (Koh Pennan), 2,055 feet (626m4) high, is part of the province of Chumporn. The northern and north-eastern sides are fringed by rocks, both above and below water, extending a short distance offshore; its western side is fringed by a reef, and shoal water extends nearly one mile offshore. An islet lies close south-westward of Tree point, the western extremity of the island.

For anchorage off Ko Pha-ngan, *see* page 148.

Tau passage.—Tau passage separates Ko Pha-ngan from Ko Tau, about 19 miles north-north-westward.

Hin Bai (Sail rock) (*Lat. 9° 56′ N., Long. 100° 00′ E.*), 43 feet (13m1) high and steep-to, lies near the middle of Tau passage, about 9 miles northward of Ko Pha-ngan.

Ko Tau is 1,171 feet (356m9) high at its north-western end. South-east islet, with a rock having a depth of less than 6 feet (1m8) over it, close south-eastward, lies about a quarter of a mile off the south-eastern side of Ko Tau, about one mile north-eastward of Column point, the southern extremity of the island. The western side of Ko Tau is fringed by a reef, and North-west islets, the largest of which is 555 feet (169m2) high, lie three-quarters of a mile off its north-western side to which they are connected by foul ground.

Middle passage.—Islets and dangers.—Middle passage lies between Ko Samui and Ko Pha-ngan on the eastern side, and a chain of islets which lies northward of Hlaem Tuet (page 144) on its western side.

Ko Hah, 263 feet (80m2) high, one of a group of five islets lying close together, is situated on the eastern side of Middle passage, about 2¼ miles west-north-westward of Hlaem Hin Khom (page 144).

Between Hlaem Hin Khom and Hlaem Chung Klam, about 4¾ miles northward, the western side of Ko Samui is fringed by a reef. Two detached shoals, with depths of 3 fathoms (5m5) over them, lie about half a mile westward and the same distance south-westward, respectively, of Hlaem Chung Klam. Between the latter and Khao Yai there is a bight in the coast. For a distance of 4 miles southward of Khao Yai, the coast of this bight is fringed by a reef which extends as much as 7 cables offshore, and there are two detached shoals, with depths of 3 and 2¾ fathoms (5m5 and 5m0) over them, respectively, lying about midway between the entrance points of the bight, and about 1¼ miles offshore.

On the western side of Middle passage, South passage lies between Hlaem Tuet (page 144) and Ko Nok Taphao (Mukapau), about 2¾ miles northward. Ko Pahlicum, with a rock, which dries, about a quarter of a mile northward of it, lies nearly one mile northward of Hlaem Tuet.

Chart 2414.

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Chart 989.

Ko Nok Taphao is 552 feet (168m2) high at its southern end and 570 feet (173m7) high at its northern end. A detached shoal, with a depth of 1½ fathoms (2m7) over it, lies about one mile south-westward of the southern extremity of the islet.

A spit, on which there are some rocks above water, extends about three-quarters of a mile northward from Ko Nok Taphao, and a bank, with depths of less than 3 fathoms (5m5) over it, extends 2¾ miles eastward.

Ko Sim (Som), 381 feet (116m1) high, and fringed with rocks, lies about 1½ miles northward of Ko Nok Taphao. Gnueh Cheu, an islet, 411 feet (125m3) high, lies about 1½ miles north-westward of Ko Sim.

Ko Chuak (Chuek) (*Lat. 9° 26′ N., Long. 99° 40′ E.*), 470 feet (143m3) high, lies about 2 miles northward of Ko Sim. A rock, with a depth of less than 6 feet (1m8) over it, was reported, in 1925, to lie nearly midway between these two islets. An islet lies about 1¼ miles north-eastward of Ko Chuak, and rocks, which dry about 3 feet (0m9), extend about half a mile from its northern side.

Ko Phaluai (Taluei), 1,117 feet (340m5) high, lies about 2¼ miles northward of Ko Chuak. Near the south-western extremity of Ko Phaluai there is a remarkable horn, 1,038 feet (316m4) high. A rock, with a depth of less than 6 feet (1m8) over it, lies about half a mile south-south-eastward of the south-western extremity of the island. Rocks, both above and below water, lie about 5 cables off its south-eastern side. A rock, named Old Woman, with another rock close westward, lies close off the northern end of Ko Phaluai, and Ko Tau-poon (Lum Wau), 516 feet (157m3) high, and surrounded by rocks, lies about half a mile off its north-western side. Ang Thaung (Angtong) passage, which is the best of those through this chain of islands, lies between Ko Phaluai and Ko Ang Thaung (Angtong), about 3¼ miles northward. An islet, named Hut, lies in the eastern approach to Ang Thaung passage, about 3 miles north-eastward of Ko Phaluai. Ko Tau (Toh), 575 feet (175m3) high, lies about 1½ miles eastward of the southern end of Ko Ang Thaung. There are some rocks, above water, about 3 cables north-eastward of Ko Tau, and two islets lie close off the south-eastern end of the island. A bank, with depths of less than 5 fathoms (9m1) over it, extends about 5 miles eastward and south-eastward from Ko Tau.

Ko Ang Thaung, 1,297 feet (395m3) high, at its southern end, is the largest of a group of islands and rocks which extends about 4½ miles northward. Ko Khraum Yaut (Klom Yot), 787 feet (239m9) high, with Ko Sam Yaut (Sam Yot) close north-eastward, lies about a quarter of a mile northward of Ko Ang Thaung. Nang Yot, an islet, 603 feet (183m8) high, lies about half a mile northward of Ko Sam Yaut, and Ko Lim, 673 feet (205m1) high, the northernmost islet of the group, lies about three-quarters of a mile north-north-westward of Nang Yot. Rocks, above water, extend about 4 cables northward from Ko Lim, and two islets, one of which is named Ko Lak Dang, lie about three-quarters of a mile westward of it.

North passage lies between Ko Lim and Ko Wao (Wau), 327 feet (99m7) high, about 5 miles northward. Castle islets, a group of four islets, lie on the northern side of North passage, about three-quarters of a mile southward of Ko Wao.

Ko Lan, 190 feet (57m9) high, is the northernmost of the chain of

Chart 2414.

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Chart 989.

islets forming the western side of Middle passage and lies about 2½ miles east-north-eastward of Ko Wao. An islet lies close southward of Ko Lan.

The western side of Ko Pha-ngan, forming the eastern side of the northern part of Middle passage, is described on page 146.

Anchorages.—Anchorage can be obtained by small vessels with local knowledge in the bights on the northern, eastern and western sides of Ko Samui, and on all sides of Ko Pha-ngan, according to the prevailing monsoon.

Coast.—Between Hlaem Tuet (page 144) and Hlaem Kung Mau (*Lat. 9° 14′ N., Long. 99° 31′ E.*), about 10 miles west-south-westward, the coast is fringed by a mud bank, which dries, extending about half a mile offshore. About 2 miles southward of Hlaem Tuet, and close inland, is a remarkable crag, 565 feet (172^{m}2) high.

Ao Bandaun.—Dangers.—Light.—Ao Bandaun (Bandon), entered between Hlaem Kung Mau and Hlaem Si (Sui), about 15 miles west-north-westward, is shallow and unnavigable except by small craft with local knowledge. The shoals in it are reported to be constantly changing in position and decreasing in depth. There are depths of 14 feet (4^{m}3) and less southward of a line joining Hlaem Si and Ko Phaluai and from the western side of Ko Phaluai to Hlaem Tuet, except for small areas off the south-western side of Ko Phaluai, and at the western end of South passage.

Ko Prap (Prab), 196 feet (59^{m}7) high, lies about 6 miles westward of Hlaem Kung Mau and about 3¾ miles offshore. The coastal bank, with depths of 6 feet (1^{m}8) and less over it, extends as much as 4½ miles northward from Ko Prap. During the South-west monsoon there are numerous fishing stakes within about 6 miles north-eastward of the islet.

A light is exhibited, at an elevation of 216 feet (65^{m}8), from a white framework structure, 20 feet (6^{m}1) in height, on the summit of Ko Prap.

The mouth of Bandaun river lies about 5½ miles south-westward of Ko Prap. The town of Pumreang is situated about 4 miles south-westward of Hlaem Si, and about three-quarters of a mile inland. Chiya sands, some of which dry and in which there appear to be some deep pools, is that part of the extensive bank, with depths of less than 6 feet (1^{m}8) over it, which fronts the north-western part of Ao Bandaun. A shoal, with a depth of 6 feet (1^{m}8) over it, lies about 1¾ miles eastward of Hlaem Si.

The coastal bank, with depths of 6 feet (1^{m}8) and less over it, off Hlaem Si and northward, extends for as much as 1¼ miles eastward from the point; a patch, which dries, lies on this bank, on a spit, which extends about 2¾ miles north-eastward from the point.

Anchorages.—Small craft with local knowledge anchor about 2 miles north-eastward of Ko Prap, in a depth of about 9 feet (2^{m}7). Small vessels, with a draught of 13 feet (4^{m}0) and over, can anchor about 6 miles northward of Hlaem Si. This is the best anchorage for vessels loading or having communication with Chiya, Pumreang and Bandaun.

Bandaun river.—Bandaun river is accessible to vessels of about 6 feet (1^{m}8) draught about the period of spring tides only, as a shallow bar across the mouth makes the passage difficult even for lighters or

Chart 2414.

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Chart 989.

small boats; at neaps the bar is impassable. The town of Bandaun (Suratthani) stands about 4 miles within the mouth. In 1937, the population was 24,870. Above the town the river is divided into two branches; by the eastern branch, it is reported that, owing to the watershed being so low, boats can communicate, with only a small porterage, with the upper waters of the Trang river, which discharges on the other side of the Malay peninsula.

Hard woods, tin, rubber, rattan canes, skins and horns are the principal exports.

There is a Custom house on Ko Prap and at Bandaun.

Communication.—Bandaun is connected to the main Thai railway system.

There is regular steamer communication with Singapore and Bangkok.

Coast.—Hlaem Kantre (*Lat. 9° 35′ N., Long. 99° 11′ E.*) lies about 15 miles north-north-westward of Hlaem Si; Clump point lies $6\frac{3}{4}$ miles farther north-north-westward, and Kaw Kau Tai lies about 10 miles northward of Clump point. Several rivulets apparently discharge through this part of the coast. Khao Kehsong (*see* view B on chart), 1,358 feet (413m9) high and conspicuous, the northern sides being very steep, lies about $2\frac{1}{2}$ miles inland about 4 miles south-south-westward of Hlaem Kantre, and Khao Krokfeum, 922 feet (281m0) high, which has a sharp conical peak and is also conspicuous, lies about 2 miles inland about $4\frac{1}{4}$ miles north-westward of the same point.

Off-lying dangers.—Buoys.—A 3-fathom (5m5) patch lies about $8\frac{1}{2}$ miles northward of Hlaem Si, and about 6 miles offshore; another shoal, with a depth of $2\frac{1}{2}$ fathoms (4m6) over it, lies 4 miles south-eastward of Hlaem Kantre, and about 3 miles offshore. A one-fathom (1m8) patch lies about $2\frac{3}{4}$ miles south-eastward of Hlaem Kantre, and $1\frac{1}{2}$ miles offshore. A rock, with a depth of 3 feet (0m9) over it, lies about $4\frac{1}{4}$ miles north-north-eastward of Hlaem Kantre and $3\frac{3}{4}$ miles offshore. Between Clump point and Kaw Kau Tai there are several off-lying shoals, some of which lie in the south-eastern approach to Langsuan roads (page 150).

The south-easternmost of these dangers is a rock, with a depth of $3\frac{1}{2}$ fathoms (6m4) over it, which lies about 11 miles east-north-eastward of Clump point. About $4\frac{1}{4}$ miles northward of this rock is another rock, with a depth of $4\frac{3}{4}$ fathoms (8m7) over it.

Two Feet Patch, with depths of less than 6 feet (1m8) over it, lies about $5\frac{1}{2}$ miles north-eastward of Clump point; a rock, with a depth of $1\frac{1}{2}$ fathoms (2m7) over it, lies about $1\frac{1}{4}$ miles farther north-eastward. North and South patches, about $1\frac{1}{2}$ miles apart, both of which are reported to dry, lie about $1\frac{1}{2}$ miles offshore, about $3\frac{3}{4}$ north-north-eastward and $1\frac{1}{2}$ miles north-eastward, respectively, of Clump point.

Loftus shoal consists of three patches close together; a rock on the middle patch, which is apparently above water, lies about $4\frac{1}{4}$ miles south-eastward of Kaw Kau Tai. The other patches, which lie westward and south-eastward of the middle one, respectively, have depths of less than 6 feet (1m8) over them. The western patch is marked on its southern side by a black conical buoy.

A rocky patch, with a depth of less than 6 feet (1m8) over it, was reported, in 1930, to lie about 4 miles southward of Kaw Kau Tai, nearly midway between Loftus shoal and the coast, but its position is doubtful.

Chart 2414.

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Chart 989.

Hin Look Saw, 8 feet (2m4) high, lies about half a mile south-eastward of Kaw Kau Tai, eastward of which are four sunken rocks; Hin Arng, the southernmost of these rocks, with a depth of 1½ fathoms (2m7) over it, lies about 4 miles eastward of Kaw Kau Tai; Hin Hamavanija, with a depth of 3 fathoms (5m5) over it, lies about 1¼ miles north-eastward of Hin Arng. About midway between Hin Hamavanija and the coast there is a rocky bank, with a least depth of 3¼ fathoms (5m9) over it. Hin Klarng Ao, with a depth of 1¾ fathoms (3m2) over it, lies about 4¼ miles north-eastward of Kaw Kau Tai (*Lat. 9° 51′ N., Long. 99° 08′ E.*), and is marked on its northern side by a white can buoy with a black band, surmounted by a globe.

All the above mentioned dangers lie in the *white* sector of Langsuan light, bearing more than 308°.

Coast.—Kaw Kau Nua, 116 feet (35m4) high, lies about three-quarters of a mile north-north-eastward of Kaw Kau Tai. The coast between Kaw Kau Tai and Langsuan river, 6 miles northward, is wooded and fringed by a narrow drying sandbank, except at a point about 3 miles northward of Kaw Kau Nua, where it is rocky. There are fishing stakes offshore during the South-west monsoon.

Langsuan roads.—Light.—Dangers.—Buoys.—Langsuan roads are situated off the mouth of Langsuan river, about 5½ miles northward of Kaw Kau Nua. The approach is encumbered with several rocks, and the coast in the vicinity is fringed by a narrow sandbank, which dries.

A light is exhibited, at an elevation of 46 feet (14m0), from a white iron framework structure, 42 feet (12m7) in height, on the southern side of the entrance to Langsuan river.

Hin Sribyatta, awash, lies about 2¼ miles east-south-eastward of Langsuan light-structure. Hin Charas, awash, lies about one mile south-westward of Hin Sribyatta, and is marked on its south-western side by a white can buoy, surmounted by a globe. East patch, awash, lies between these two dangers. Vessels approaching the inner part of the roads from southward should pass westward of this buoy.

Two rocks close together lie about 1¼ miles eastward of Langsuan light-structure; the northern rock, named Middle patch, has a depth of less than 6 feet (1m8) over it, and the southern rock, named Hin Rua Tid, is awash. Hin Nai Pin, with a depth of less than 6 feet (1m8) over it, lies about one mile north-eastward of Hin Rua Tid.

Falcon patch, with a depth of 3 feet (0m9) over it, lies about 1¾ miles north-eastward of the light-structure, and is marked on its western side by a white spherical buoy with a black band, and having a topmark.

Hin Haeng, with a depth of 2¼ fathoms (4m1) over it, lies about 2 miles north-eastward of Falcon patch. Hin Mai, with a depth of 5 fathoms (9m1) over it, lies about 3¼ miles eastward of Hin Haeng. There is a rock, with a depth of 4¾ fathoms (8m7) over it, about 1¾ miles south-south-eastward of Hin Mai, and two other rocks, about half a mile apart, the eastern of which has a depth of 4¾ fathoms (8m7) over it, and the western 4¼ fathoms (7m8), lie about one mile south-south-westward of Hin Mai.

Hin Tong Wo, with a depth of 4¼ fathoms (7m8) over it, lies about 7 miles north-eastward of Langsuan light-structure. Two shoals,

Chart 2414.

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Chart 989.

with depths of 5½ and 4¾ fathoms (10m1 and 8m7) over them, lie about 1½ and 2 miles, respectively, south-westward of Hin Tong Wo.

Hin Charas and the dangers lying northward and north-eastward of it, described above, are covered by the *red* sector of Langsuan light between the bearings of 223° and 308°.

The mouth of Langsuan river, on the northern side of which there is a village, is obstructed by a shifting bar, over which there is a depth of about 6 feet (1m8) at high water; in the rainy season the out-going stream from the river attains a rate of about 4 knots. There are drying sandspits off the mouth and a bank, with depths of less than 3 fathoms (5m5) over it, extends about one mile offshore. During the South-west monsoon numerous fishing stakes are established between Langsuan and Khao Lem Riu, 387 feet (118m0) high, about 4 miles northward.

Anchorage.—Communication.—Small vessels with local knowledge are reported to be able to obtain secure anchorage in the inner part of Langsuan roads, westward of the inner line of dangers, in a depth of 3 fathoms (5m5).

There is regular steamer communication with Singapore and Bangkok.

Langsuan is connected to the Thai railway system, the station being situated at Amper Khan Ngern, a town, about 5 miles westward of the river mouth.

Coast.—Khao Tong Wo (*Lat. 10° 02′ N., Long. 99° 10′ E.*), 351 feet (107m0) high, lies about 1¼ miles northward of Khao Hlaem Riu; between them is Ao Tong Wo, a small bight, which dries nearly out to the line joining its entrance points (*see* view B on chart). Between Khao Tong Wo and Khao Ka tah, 1,017 feet (310m0) high, about 3 miles north-westward, the coast is wooded, and fringed by a sand and mud flat, which dries, extending from 3 to 5 cables offshore.

The mouth of Ta-ko river lies close northward of Khao Ka tah. Between the latter and Hlaem Ngu (Knu), about 3½ miles northward, the coast is wooded and fringed by a drying bank, which extends from about 1½ to 5 cables offshore. During the South-west monsoon there are numerous fishing stakes in this portion of the bight. A reef extends about three-quarters of a mile southward and south-eastward from Hlaem Ngu. A rock, above water, lies close offshore about one mile northward of Hlaem Ngu.

Between Hlaem Ngu and Hlaem Pra-cham Hieng (Lem Chang Hin), 833 feet (253m9) high, about 7 miles north-eastward, the coast is hilly, except within the shores of a small bay, which dries, about 3 miles south-westward of the eastern extremity of Hlaem Pra-cham Hieng.

Off-lying islets and dangers.—Light.—Ko Bhidhak (Pitak), 325 feet (99m1) high, lies about half a mile north-eastward of Khao Tong Wo, connected by a ridge which dries; a ledge of rocks, on which is Hin Pitak, above water, extends about half a mile eastward from Ko Bhidhak.

Ko Gram (Kram), 190 feet (57m9) high, and surrounded by foul ground, lies about three-quarters of a mile northward of Ko Bhidhak, and about 1½ miles offshore. Ko Rangbantad (Ranpahtat), a rocky islet, 80 feet (24m4) high, lies about 3 miles north-north-eastward of Ko Gram.

A light is exhibited, at an elevation of 112 feet (34m1), from a white

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iron framework structure, 30 feet (9m1) in height, on Ko Rangbantad (*Lat. 10° 07′ N., Long. 99° 12′ E.*).

Ko Kee-nok (Kenoh), 29 feet (8m8) high, lies about 1¾ miles westward of Ko Rangbantad. Two islets lie about one mile southward of Hlaem Ngu and about three-quarters of a mile offshore. Ko Karngsua (Kang Sueh), 194 feet (59m1) high, and Ko Ranghar, 245 feet (74m7) high, lie about 3¼ and 2¼ miles, respectively, eastward of Hlaem Ngu, and Ko Ma-prao (Prau), 423 feet (128m9) high, lies on the outer edge of the reef which extends south-eastward from the same point.

Ko Mad Wai Yai (Mate Yie), 177 feet (53m9) high, with Ko Mad Wai Noi (Mate Yie Lak), 203 feet (61m9) high, close northward, lies about 1½ miles southward of Hlaem Pra-cham Hieng. Ko Tong Keo (Tong Kau), 82 feet (25m0) high, lies midway between Ko Mad Wai Yai and the coast westward. Ko Raed lies about three-quarters of a mile southward of the eastern extremity of Hlaem Pra-cham Hieng, and about 2 cables offshore, with Ko Noi half a mile westward and close offshore.

Off Ko Mad Wai Yai the stream sets northward on the rising tide.

Sawee bay.—Islets and dangers.—Sawee (Sawi) bay is entered between Hlaem Pra-cham Hieng and Khao Hlaem Tian, about 7 miles north-north-eastward. Khao Look Klarng, 577 feet (175m9) high, lies about one mile northward of Khao Hlaem Tian. The head of Sawee bay is fringed by a mud flat, which dries, extending over 2 miles offshore in places, and depths of less than 3 fathoms (5m5) extend nearly as far as the line joining the entrance points. Only small vessels with local knowledge should enter the bay.

Ko Ku la (Kulah), which has a sharp peak, 574 feet (175m0) high, lies about one mile north-eastward of Hlaem Pra-cham Hieng, with Ko Krah, 141 feet (43m0) high, lying between them. Ko Yung, 256 feet (78m0) high, lies about 1¼ miles north-westward of Ko Ku la. A group of islets lie within 1¼ miles north-westward of the northern side of Hlaem Pra-cham Hieng; of these, Ko Meo, 299 feet (91m1) high, is the largest and southernmost; Ko Kee-nok, 46 feet (14m0) high, lies about a quarter of a mile north-eastward of Ko Meo; Ko Nu, 249 feet (75m9) high, lies about a quarter of a mile northward of Ko Meo, and is the northernmost of the group. A rock, awash, lies about 4 cables westward of Ko Meo.

Ko Klaeb (Klap), 85 feet (25m9) high, lies about 1½ miles north-north-eastward of Ko Yung. Foul ground extends about 6 cables westward of Ko Klaeb, and Ko Bart, 75 feet (22m9) high, lies 4 cables south-westward of the same island. Ko Hua Kra-chong (Kenoh), 26 feet (7m9) high, lies about 2¾ miles westward of Ko Klaeb and about 1¼ miles offshore. Ko Rang Ka-chiu (Rangkachew), 222 feet (67m7) high, lies about 2½ miles south-eastward of Khao Hlaem Tian. Ko Duohng Hlang, 317 feet (96m6) high, with some rocks, above water, 2 cables northward, lies about one mile westward of Ko Rang Ka-chiu. Ko Ka (Kah), 66 feet (20m1) high, lies in the north-eastern approach to Sawee bay, about one mile east-south-eastward of Khao Hlaem Tian.

Coast.—Buoy.—Between Khao Hlaem Tian (*Lat. 10° 22′ N., Long. 99° 15′ E.*) and a point about 4 miles northward, the coast is fringed by a narrow reef, except in front of the sandy beaches; hills

Chart 2414.

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Chart 989.

close to the coast rise to an elevation of from 330 to 500 feet (100^{m}6 to 152^{m}4). Ko Kawtian lies on a reef close north-eastward of the last mentioned point; there are depths of less than 3 fathoms (5^{m}5) between this point and Ko Samed.

A white conical buoy, with a black band, surmounted by a globe, is moored close north-eastward of Ko Kawtian.

Off-lying islands and dangers.—Ko Lavah, 177 feet (53^{m}9) high, lies about 1¼ miles north-eastward of Ko Ka. A rock, with a depth of 4 fathoms (7^{m}3) over it, lies about 1¾ miles eastward of Ko Lavah, and a 4¼-fathom (8^{m}7) patch lies about 1¼ miles south-south-eastward of the same island.

Ko I-red (Ea-raed), 311 feet (94^{m}8) high, with Hin Lak Ea-raed, 63 feet (19^{m}2) high, and other rocks above water close north-eastward, lies about three-quarters of a mile north-eastward of Ko Lavah. Ko Mabhrao (Maprao), 206 feet (62^{m}8) high, lies 6 cables offshore and about 1¾ miles west-north-westward of Ko I-red, with a detached 2-fathom (3^{m}7) patch nearly midway between them.

Ko Matra (Martra), 433 feet (132^{m}0) high, with rocks extending a short distance from its north-eastern and south-western ends, lies about 1½ miles north-eastward of Ko I-red. Ko Sak (Sark), 118 feet (36^{m}0) high, lies about 2½ miles north-westward of Ko Matra.

Chumporn bay and approaches.—Islands and dangers.—Light.—Chumporn bay is entered between Ko Kawtian and Hlaem Goh Kwang (Lem Kawkwarng), about 5½ miles northward. The mouth of the Glohng yai (Klong Ta-tapou) is situated about 2 miles north-westward of Ko Kawtian. There is a village on each side of the mouth.

Ko Samed (Samet), 265 feet (80^{m}8) high, lies about 1¼ miles north-westward of Ko Sak. Ko Samed is fringed with rocks; a rock, awash, lies 3 cables westward of its south-western extremity, and a bank, with depths of 3 fathoms (5^{m}5) and less over it, extends 4 cables eastward from its north-eastern side. A shoal, with a depth of 4¾ fathoms (8^{m}7) over it, lies 6 cables eastward of the northern extremity of Ko Samed (*Lat. 10° 27′ N., Long. 99° 16′ E.*).

A bank, which dries, extends as much as 2 cables offshore between Ko Kawtian and a position about 6 cables south-eastward of the mouth ol Glogng yai, where there is a rocky projection.

Hin Lakmartra, 6 feet (1^{m}8) high, lies about 2 miles north-north-eastward of Ko Matra. A spit, with a least depth of 3¼ fathoms (5^{m}9) over it, extends about 4½ cables westward from Hin Lakmartra. Ko Hlak (Lak) Ngam, 59 feet (18^{m}0) high, lies about 2½ miles north-eastward of Hin Lakmartra.

Ko Taluh, 91 feet (27^{m}7) high, with Ko Kaloak, 128 feet (39^{m}0) high, about three-quarters of a mile north-eastward, lies about 2½ miles west-north-westward of Ko Hlak Ngam.

Ko Ngam Yai (Nam), 351 feet (107^{m}0) high, with an islet, 187 feet (57^{m}0) high, close southward, lies about 3 miles east-north-eastward of Ko Kaloak.

Ko Chorakhay, 133 feet (40^{m}5) high, lies about 4¼ miles north-north-westward of Ko Ngam Yai. A reef extends half a mile westward from the south-western end of Ko Chorakhay and a shoal, with a depth of 3¾ fathoms (6^{m}9) over it, lies about one mile westward of the same point.

Chart 2414.

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Ko Mat-bhon (Matapoan), 150 feet (45m7) high, lies about a quarter of a mile north-eastward of the mouth of the Glohng yai. It is connected to the river mouth by a drying bank which extends off the coast, forming the head of Chumporn bay, for nearly half a mile. The southern part of this bank consists of sand and the northern part of mud; the northern end of the bank is about 2¾ miles north-north-westward of Ko Mat-bhon.

A light is exhibited, at an elevation of 154 feet (46m9), from a white iron framework structure, 20 feet (6m1) in height, on Ko Mat-bhon.

Hin Chumporn, with a depth of less than 6 feet (1m8) over it, lies in the northern part of the bay, about 1½ miles south-south-eastward of Hlaem Ko Kwang (Lem Hawkwarng). Hin Chumporn is covered by the *red* sector of Ko Mat-bhon light between the bearings of 208° and 216°. A shoal, with a depth of 1½ fathoms (2m7) over it, lies about midway between Hin Chumporn and the shore of the bay west-north-westward.

Hlaem Ko Kwang has a hill, 180 feet (54m9) high, at its extremity, which is connected to the coast, south-westward of it, by a low isthmus covered with trees. The coast on the northern side of Chumporn bay is hilly, the eastern slopes rising steeply. The summit, Khao Larn, is 383 feet (116m7) high, and lies about one mile south-westward of Hlaem Ko Kwang (*Lat. 10° 31′ N., Long. 99° 15′ E.*).

During the South-west monsoon there are numerous fishing stakes in Chumporn bay.

Tidal streams.—In Chumporn bay the tidal streams set in a south-westerly direction on the rising tide and in a north-easterly direction on the falling tide; the south-west-going stream runs at a rate of from one quarter to half a knot.

Anchorages.—Communication.—During the South-west monsoon anchorage may be obtained in Chumporn bay about 1½ miles north-eastward of Ko Mat-bhon, in depths of from 4 to 5 fathoms (7m3 to 9m1).

During the North-east monsoon, small vessels with local knowledge can obtain shelter under Ko Samed.

There is regular steamer communication with Bangkok and Singapore.

The town of Jumbhorn (Chumporn), connected to the Thai railway system, is situated about 9 miles from the mouth of Glohng yai.

Coast.—Ao Panangtak is entered between Hlaem Ko Kwang and Hlaem Dhung Dhrai, a point about 1½ miles northward. The shores at the head of the bay are wooded. The coastal bank of sand at the head of the bay dries out to a distance of as much as three-quarters of a mile. A reef, which dries and which is fringed by rocks with a depth of less than 6 feet (1m8) over them, lies 2½ cables offshore and about one mile west-south-westward of the northern entrance point of the bay.

Khao Po-bach, 347 feet (105m8) high, lies nearly one mile north-north-eastward of the northern entrance point of Ao Panangtak, and is situated at the northern end of a range of hills extending from that point and rising steeply from the coast.

Between Khao Po-bach and Hlaem Dhen (Lem Tane), a peninsula fringed by a narrow reef with sunken rocks close off its southern and south-eastern sides, about 9 miles north-north-eastward, there is a

Chart 2414.

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Chart 989.

bight, the northern part of which, Ao Bang Son, is shallow. At the southern extremity of Hlaem Dhen there is a hill with a red cliff, and Ban Natan (Bang San) is situated on the coast about 2 miles westward; native craft occasionally anchor in this part of the bight.

Chart 2719.

Between Hlaem Dhen and a point about 2 miles northward, there is a small shallow bay, the head of which dries. A rock, with a depth of less than 6 feet (1m8) over it, lies close off the southern entrance point and a drying reef extends about one mile southward from the northern entrance point. A rock, with a depth of 2½ fathoms (4m6) over it, lies in the approach to this bay about three-quarters of a mile north-eastward of Hlaem Dhen. A rock, above water, lies about 3 cables south-eastward of the northern entrance point of the bay, and Table rock, 82 feet (25m0) high, lies about 3 miles north-north-eastward of the same point and half a mile offshore. Between these two rocks, the coast is fringed by a reef, which extends half a mile offshore in places.

Khao Yai Bang Chark, 627 feet (191m1) high, the eastern of which is steep, lies on the coast about 7 miles north-north-eastward of Hlaem Dhen.

Khao Hiemyai, a remarkable craggy headland, 951 feet (289m9) high, is the highest part of a peninsula lying about 9 miles north-north-eastward of Khao Yai Bang Chark. Hlaem Chong Prah (*Lat. 10° 54′ N., Long. 99° 30′ E.*) is the southern extremity of this peninsula, and lies about 2½ miles south-south-westward of Khao Hiemyai.

Ko Wieng (Buot), 912 feet (278m0) high, lies about a quarter of a mile south-westward of Hlaem Chong Prah; this island is situated on the south-eastern edge of the drying bank which occupies most of the bay westward of Hlaem Chong Prah. A rock, above water, with an islet about a quarter of a mile north-eastward, lies close off the north-western extremity of Ko Wieng, and another islet lies about a quarter of a mile off the north-western side of the island.

Westward of Ko Wieng the bay is known as Ao Pa-tiu (Chong P'ra); Ban Park klong Pa-tiu stands on the southern side of a stream which flows into Ao Pa-tiu, about 3½ miles westward of Hlaem Chong Prah.

Off-lying islets.—Light.—Ko Khai (Kye), 348 feet (106m1) high, lies about 3 miles north-eastward of Hlaem Dhen. Four islets lie south-eastward of Ko Wieng. Ko Ranped (Rang Kye), the outermost, and 82 feet (25m0) high, lies about 5 miles south-eastward of Ko Wieng. Ko Rangkai (Rang Pet), 95 feet (29m0) high, lies about 1¼ miles north-north-eastward of Ko Ranped. Ko Rang, 323 feet (98m4) high, lies about 1½ miles south-eastward of the south-western extremity of Ko Wieng.

An islet, 164 feet (50m0) high, with a rock, over which there is a depth of 7 feet (2m1), close north-eastward, lies about 1¼ miles north-north-eastward of Ko Rang and three-quarters of a mile off the south-eastern side of Ko Wieng.

A light is exhibited, at an elevation of 328 feet (100m0), from a white iron framework structure, 20 feet (6m1) in height, on the summit of Ko Rang.

Chart 2414.

Outlying dangers.—Koik rock (*Lat. 10° 50′ N., Long. 101° 03′ E.*), with a depth of 6 feet (1m8) over it, was reported, in 1882, by the master

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Chart 2414.

of a Norwegian vessel of that name. It is charted about 94 miles eastward of Hlaem Chong Prah.

Two reefs were reported, in 1889, to lie in this neighbourhood, one in lat. 10° 45′ N., long. 101° 01′ E. and the other about 5 miles westward of that position; they are all probably one and the same reef.

A shoal, with a depth of 7 fathoms (12m8) over it, was reported, in 1948, to lie in a position about 28½ miles north-westward of Koik rock.

Chart 2721.

Simpson shoal, the depth over which is unknown, and the existence of which is doubtful, was reported, in 1886, to lie in lat. 11° 26′ N., long. 101° 12′ E., about 36 miles northward of Koik rock.

Chart 2719.

Coast.—Off-lying islets and rocks.—Hlaem Me-rampüng (Tong Lan), 745 feet (227m1) high and having the appearance of an island from a distance owing to the low elevation of the coast westward of it, lies about 18 miles northward of Khao Hiemyai. Westward of Hlaem Me-rampüng, there is a shallow bay.

Ko Talu (Tlu) (*Lat. 11° 05′ N., Long. 99° 32′ E.*), 289 feet (88m1) high and flat, lies about 3 miles offshore and 6½ miles southward of Hlaem Me-rampüng; a reef extends about three-quarters of a mile westward from the south-western end of Ko Talu. Ko Sing lies about 1½ miles south-westward of Ko Talu; a rock, with a depth of less than 6 feet (1m8) over it, lies about 6 cables northward of Ko Sing, with a depth of 1¼ fathoms (2m3) between it and the reef extending from Ko Talu. A detached shoal, with a depth of 2¾ fathoms (5m0) over it, lies midway between Ko Sing and the coast. Ko Sang (Chang) lies about 1½ miles south-south-westward of Ko Sing and about one mile offshore; a shoal, with a depth of 2¼ fathoms (4m1) over it, sand, lies about three-quarters of a mile east-north-eastward of Ko Sang.

An islet lies close offshore, close northward of Hlaem Me-rampüng, and Ko Ramra, which is low and surrounded by a reef, lies close offshore about 10½ miles farther northward. A detached shoal, with a least depth of 2¾ fathoms (5m0) over it, at its southern end, lies from one to 2 miles southward of Ko Ramra, and about one mile offshore; Hin Krood, awash, lies midway between the northern end of this shoal and the coast. Hlaem Kum lies about 4 miles northward of Ko Ramra; some rocks, with depths of less than 6 feet (1m8) over them, lie close off Hlaem Kum.

A group of conical hills, the highest of which has an elevation of 755 feet (230m1), lies about one mile inland, 12 miles northward of Hlaem Me-rampüng. Khao Chakrah, the northernmost of these hills, is 699 feet (213m1) high. Khao Klong Warn, 827 feet (252m1) high, a remarkable rocky horn, is the summit of a hilly projection lying a short distance inland, about 34 miles north-north-eastward of Hlaem Me-rampüng. Ko Chan, 203 feet (61m9) high, lies about 8 miles southward of Khao Klong Warn and about 4 miles offshore.

Hin Kong Nork, awash, lies about 4 miles west-north-westward of Ko Chan and half a mile offshore. A detached shoal, with a depth of 2¾ fathoms (5m0) over it, lies about half a mile eastward of Hin Kong Nork, and a rock, with less than 6 feet (1m8) over it, lies between it and the coast.

Hin Chuang and Hin Kong Nai, both awash, lie about 1½ and 2 miles, respectively, north-north-eastward of Hin Kong Nork and half a mile offshore.

Chart 2414.

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Chart 2719.

Khao Luang, 4,088 feet (1,246^{m}0) high and prominent, lies about 7 miles inland westward of Ko Chan.

From Khao Klong Warn the hills extend about one mile south-eastward. Westward of these hills is a small bight, at the head of which Klong Warn is entered; this creek runs along the western side of Khao Klong Warn and, at its northern end, enters Ao Ma-nao. At the southern mouth of the creek is a drying mud flat which extends about 2 cables off the north-western shore of the above-mentioned bight.

Ban Klong Warn is situated along the western side of the southern mouth of Klong Warn.

Ko Pang, 240 feet (73^{m}1) high, lies about 2 miles south-westward of the south-eastern extremity of the hills extending from Khao Klong Warn and on the south-eastern edge of the coastal bank, with depths of less than 3 fathoms (5^{m}5) over it, which extends about 1¾ miles offshore in this vicinity; Ko Ping, 210 feet (64^{m}0) high, with a rock awash, close westward, lies about three-quarters of a mile northward of Ko Pang.

Ao Ma-nao is entered between the south-eastern extremity of the hills extending from Khao Klong Warn and Khao Ruam Muak, another remarkable horn, 814 feet (248^{m}1) high, the summit of a peninsula, about 2½ miles northward. A rock, above water, lies close offshore about half a mile northward of the southern entrance point.

Ko Hloeam (Luem) (*Lat. 11° 45′ N., Long. 99° 48′ E.*), 381 feet (116^{m}1) high, lies in the approach to Ao Ma-nao, about 1¼ miles south-eastward of Khao Ruam Muak. Ko Ea-an, 109 feet (33^{m}2) high, lies inside the entrance, about one mile west-north-westward of Ko Hloeam.

The head of Ao Ma-nao dries; and depths of less than 3 fathoms (5^{m}5) extend offshore as far as the line joining the entrance points.

Caution.—Bombing by aircraft is practised eastward of Ao Ma-nao over an area which is indicated by a pecked line on the chart.

Prachuab Girikhan.—Islets and dangers.—Light.—The town of Prachuab Girikhan (Kirikan), connected with the Thai railway system, lies at the head of a shallow bay which is entered between Khao Ruam Muak and a point about 2½ miles north-north-eastward. The shore of the bay is fringed by a drying coastal bank which consists of sand, except in that part westward of the northern entrance point, where it consists of mud. The northern entrance point is the southern extremity of a hilly peninsula, the summit of which Mohng (Mong) Lai, is 834 feet (254^{m}2) high and about one mile northward of the point. The sides of the hills slope steeply to the coast.

Khao Maun is situated about 7 miles westward of Prachuab Girikhan.

A rock, awash, lies about 8½ cables eastward of Khao Ruam Muak. Three islets lie on the edge of the coastal bank close northward of Khao Ruam Muak; Ko Lak, the northernmost of these islets, is 364 feet (111^{m}0) high.

Ko Red (Rad), 410 feet (125^{m}0) high, lies eastward of the last-mentioned islets, separated from them by a channel about a quarter of a mile wide, in the fairway of which are depths of 3½ fathoms (6^{m}4).

A light is exhibited, at an elevation of 413 feet (125^{m}9), from a white concrete tower, 13 feet (4^{m}0) in height, on the summit of Ko Red.

Chart 2414.

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Chart 2719.

Coast.—Off-lying islets.—Light.—Between the northern end of Mohng Lai and a point on the coast, about 16 miles north-north-eastward, there is a bight in the coast, which is wooded. Ban Kui lies at the mouth of a stream, about 4 miles south-south-westward of the northern entrance point of the bight; between the latter point and Ban Kui the coast is fringed by a drying mudbank, extending as much as one mile offshore.

About one mile northward of the northern entrance point of the bight, and close to the coast, is a hill, 542 feet (165^{m}2) high.

Charts 2720, 2719.

Between the hill, mentioned above, and a point about 6 miles north-north-eastward is another bight, the shore of which is wooded. A stream runs into the bight about 2 miles northward of the hill.

The shore of the southern part of the bight is fringed by a drying sand and mud flat extending about three-quarters of a mile offshore, and that of the northern part of the bight by a drying sandbank, extending about a quarter of a mile offshore.

Ko Sattagoot (*Lat. 12° 12′ N., Long. 100° 00′ E.*), 489 feet (149^{m}1) high, lies half a mile north-north-eastward of the last-mentioned point, with a rock, above water, between them, close offshore.

Chart 2720.

Khao Samroiyot, a remarkable range of rocky mountains, lies about 5 miles inland, westward of Ko Sattagoot. The two highest peaks, with an elevation of 1,950 feet (594^{m}4), are situated at the northern end of the range, which, at a distance, has the appearance of a serrated table land and is unlike any other land in the Gulf of Thailand.

Ko Golum, 643 feet (196^{m}0) high, lies about 2 miles north-westward of Ko Sattagoot and about three-quarters of a mile offshore. Ko Nom Sao, 299 feet (91^{m}1) high, lies between the southern end of Ko Golum and the coast, and two islets lie about half a mile south-eastward of Ko Nom Sao, close offshore.

A rocky bank, with a depth of 1½ fathoms (2^{m}3) over it, near its outer edge, extends about 2 miles offshore, 6 miles northward of Ko Golum. Pran river discharges about 10 miles northward of Ko Golum.

About 3½ miles northward of the mouth of the Pran river, and about three-quarters of a mile offshore, are two islets, about three-quarters of a mile apart in a northerly direction, named, respectively, Ko Kee Nok and Ko Sai, each about 100 feet (30^{m}5) high; Ko Kee Nok, the southern islet, consists of two islets close together.

Hin Sau, which dries about 3 feet, lies about 2 miles northward of Ko Sai, and about three-quarters of a mile eastward of a small headland which stands out prominently from the coast.

Hua Hin light is occasionally exhibited, at an elevation of 38 feet (11^{m}6), from a white wooden framework structure, 32 feet (9^{m}8) in height, from the northernmost of a group of rocks off the coast about 4 miles north-north-westward of Hin Sau.

Khao Pak Plar, 1,480 feet (451^{m}1) high, lies 9½ miles north-westward of the small headland abreast Hin Sau. Khao Pra Rob Tai, 2,133 feet (650^{m}2) high, lies 7 miles north-north-westward of Khao Pak Plar. Khao Chau lai, 1,211 feet (319^{m}2) high, lies about 6½ miles north-eastward of Khao Pak Rob Tai.

Hlaem Phak Bia (Lem Pug Bia), which is low, lies about 32 miles northward of the small headland mentioned above, the coast between them being wooded.

Chart 2414.

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Chart 2720.

A bank, with depths of less than 6 fathoms (11m0) over it, extends about 24 miles southward from Hlaem Phak Bia, and has a depth of 5¼ fathoms (9m6) at its southern extremity, situated about 8 miles offshore. There are several patches, with depths of from 1¼ to 2¾ fathoms (2m3 to 5m0) over them, on this bank, the positions of which may best be seen on the chart.

Vessels should give this part of the coast a wide berth and not approach it within a depth of 10 fathoms (18m3).

Several villages are situated along this stretch of coast, the most important being Ban Cha-am, about 15 miles south-south-westward of Hlaem Phak Bia, and Hart Chau Samran, situated about 3 miles south-south-westward of the same point.

Between Hlaem Phak Bia (*Lat. 13° 02′ N., Long. 100° 04′ E.*) and a point about 7 miles north-north-westward there is a bight in the coast entirely occupied by a mudbank, which dries. Ban Pak Tha Le is situated about one mile westward of the last-mentioned point, and Ban Hlaem (Lem) stands about 5½ miles farther north-westward, on the southern side of the mouth of a river; a drying mud flat extends off the coast between these two villages from about half a mile to 2 miles.

Klong Bang Gaboon, which leads into Pechaburi river, is situated about 4 miles north-westward of Ban Hlaem. Between Ban Hlaem and Klong Bang Gaboon, the coastal mudbank, which dries, extends about half a mile offshore. Thence to the southern entrance point of Maenam Mae klaung, about 6½ miles north-eastward, there is a bight fringed by a mudbank, which dries.

Maenam Mae klaung.—The mouth of Maenam Mae klaung (Meklong river) is about a quarter of a mile wide. A bar, the depth over which is less than 3 feet (0m9), obstructs the entrance about 3½ miles offshore, and the mouth is approached by a channel between banks of soft mud which dry, and extend about 2 miles offshore.

Meklong, a town, about 3 miles northward of the entrance, is connected to the Thai railway system. There is a flagstaff at the Naval station.

Coast.—Between the mouth of Maenam Mae klaung and the mouth of Maenam Tha chin (Tachin), about 19 miles east-north-eastward, the coast is low and wooded; it is fringed by a mud flat, which dries, extending from about a quarter of a mile to 2 miles offshore. There are numerous fishing stakes in this vicinity.

Maenam Tha chin.—The mouth of Maenam Tha chin was obstructed, in 1945, by a bar, with a depth of about one foot (0m3) over it, and is 2½ miles wide. The entrance is difficult to distinguish, as the land in the neighbourhood is low and covered with trees. Tha chin (Tachin), a town connected to the Thai railway system, stands on the left bank of the river, about 2 miles northward of the mouth. There is a flagstaff at the Naval Station.

H.M.S. *Teazer*, drawing about 11 feet (3m4), in November, 1871, near the time of the highest tides in the year, ascended the river as far as Nakonchisi, a town about 25 miles from the mouth.

Coast.—Between the mouth of Maenam Tha chin and Fort Phra Chula Chom Klao, the western entrance point of Maenam Chao Phraya, about 18 miles eastward, the coastal mudbank, which dries, extends from about a quarter of a mile to 2 miles offshore, and depths of less

Chart 2414.

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Chart 2720.

than 6 fathoms (11m0), extend about 11 miles offshore. There are numerous fishing stakes off this coast.

Chart 999.

MAENAM CHAO PHRAYA.—General description.—Maenam Chao Phraya is entered at the head of the Gulf of Thailand between Fort Phra Chula Chom Klao (*Lat. 13° 32′ N., Long. 100° 35′ E.*) and a point about one mile north-eastward. It rises in the northern part of Thailand near the Tonkin frontier, and is navigable for small craft for a distance of about 60 miles. The city of Bangkok is situated about 25 miles by river above the mouth and is accessible to all vessels that can cross the bar. The river has many tributaries. At times the surface of the river is completely covered with floating weed.

Bar.—Depths.—The bar is subject to frequent changes, and extends about 8 miles southward from the entrance points. When the river is at its lowest level, about the months of July and August, there is sometimes not more than 3 feet (0m9) over the bar; the depth over the bar at the highest tide at this time of the year will be about 12 feet (3m7), and, in the month of February, when the river level is highest, about 15 feet (4m6). The depths are also affected by the wind, southerly winds increasing them. When a strong north-easterly or easterly wind is blowing in the gulf the depths will be increased; with strong westerly winds and heavy north-westerly or westerly squalls the in-going stream is retarded and the depths are reduced.

A typhoon in the China sea, in the neighbourhood of Cap St. Jacques (page 218), has been known to decrease the depth on the bar by as much as 3 feet (0m9).

See Caution on page 161.

Vessels can be forced through the mud, which is very soft. Vessels drawing 14 feet (4m3) are taken up to Bangkok but those drawing 16 feet (4m9), and above, may have to wait for a suitable tide.

It should be borne in mind, in the case of vessels outward bound from Bangkok, that the water over the bar is brackish, and vessels leaving the port with a mean draught of, say, 14 feet (4m3) will only lighten by about 3 inches (0m07).

Extensive banks of mud and sand dry on the bar, and it is covered with fishing stakes, which extend about 1½ miles southward from Bangkok bar lighthouse, except within the channel over the bar. Lights are exhibited from these stakes at night.

Many years ago, junks laden with stones were sunk at intervals across the entrance to the river abreast the western entrance: the fairway, in which there is a least depth of 9 feet (2m7), lies over the remains of the middle junk.

Lights.—Buoyage.—Beacons.—A light is exhibited, at an elevation of 56 feet (17m1), from Bangkok bar lighthouse, a white concrete tower, about 6 miles southward of the flagstaff on Fort Phra Chula Chom Klao.

Outer leading lights are established on the coast eastward of the entrance to the river. The front light is exhibited, at an elevation of 53 feet (16m2), from a white concrete framework beacon, surmounted by a red diamond, situated about 2½ miles east-south-eastward of Fort Phra Chula Chom Klao; the rear light is exhibited, at an eleva-

Chart 2414.

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Chart 999.

tion of 76 feet (23m2), from a similar structure, situated 6½ cables north-north-eastward of the front light. These lights in line bear 018°.

A light is exhibited, at an elevation of 53 feet (16m2), from a white concrete framework beacon, surmounted by a red diamond, on the western bank of the river about 1½ miles north-north-westward of Fort Phra Chula Chom Klao.

A can light-buoy, painted in red and white bands, exhibiting a *green flashing* light *every three seconds*, is moored about 9 cables south-westward of the bar lighthouse.

A can light-buoy, painted in red and white bands, exhibiting a *white flashing* light *every three seconds*, is moored about 4½ cables north-north-eastward of the bar lighthouse.

These light-buoys mark the dredged channel across the bar.

A can light-buoy, painted in red and white bands, exhibiting a *red flashing* light *every three seconds*, is moored on the alignment of the outer leading light-structures, just over 2 miles north-north-eastward of the bar lighthouse (*Lat. 13° 26′ N., Long. 100° 36′ E.*); this light-buoy marks the position in the outer dredged channel from which vessels should commence to bear eastward in order to negotiate the turn from the alignment of the outer dredged channel leading light-structures to the inner dredged channel.

A can light-buoy, painted in green and white bands, exhibiting a *green flashing* light *every four seconds*, is moored on the eastern side of the fairway, about 1¼ miles southward of the front leading light.

A can light-buoy, painted in red and white bands, exhibiting a *white flashing* light *every two seconds*, is moored on the north-eastern side of the fairway, about 6½ cables westward of the front leading light.

A light-buoy, painted in red and white bands, exhibiting a *red flashing* light *every three seconds*, is moored on the eastern side of a wreck, situated about 1½ miles westward of the front leading light.

Caution.—Owing to frequent changes in the depths on the bar the position of the buoys and beacons are constantly being altered.

Pilotage.—A pilot vessel is anchored outside the bar, nearly 2 miles south-south-westward of the bar lighthouse. A light is exhibited from the light-vessel.

The services of licensed pilots can be obtained.

Pilotage is compulsory in all Thai ports for merchant vessels, except those under 250 tons register and certain local craft.

The area within which pilotage is compulsory in the approach to Bangkok is from about a depth of 4½ fathoms (7m8) outside the bar near the pilot vessel.

Vessels subject to compulsory pilotage, intending to cross the bar, should inform the harbour authorities prior to entering or leaving the compulsory pilotage area. Having carried out these instructions, vessels should approach the pilot vessel, outside the bar, within a distance of at least 3 cables.

The pilot flag is white and red horizontal, white uppermost.

Tidal signals.—Vessels desirous of knowing the depth over the bar, above chart datum, should by day, dip and hoist a black ball, and by night, should dip and hoist a *white* light. The answering signal from the bar lighthouse will be displayed until the vessel hauls down her signal, such action on the part of the vessel being taken to indicate that the signals from the bar lighthouse have been understood.

Charts 2720, 2414.

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Chart 999.

The bar lighthouse (*Lat. 13° 26′ N., Long. 100° 36′ E.*) may display tidal signals without having been requested to do so.

The following signals, made with balls, cones and cylinders by day, and with lights by night, are made from the bar lighthouse on request:—

By day:

Depths less than 3·3 feet (1^m0), a ball.

Depth 3·3 feet (1^m0), a cylinder.
,, 4·0 ,, (1^m2), a cone.
,, 4·6 ,, (1^m4), two balls.
,, 5·3 ,, (1^m6), a ball over a cylinder.
,, 5·6 ,, (1^m7), a ball over a cone.
,, 6·0 ,, (1^m8), a cylinder over a ball.
,, 6·3 ,, (1^m9), two cylinders.
,, 6·6 ,, (2^m0), a cylinder over a cone.
,, 7·0 ,, (2^m1), a cone over a ball.
,, 7·3 ,, (2^m2), a cone over a cylinder.
,, 7·6 ,, (2^m3), two cones.
,, 8·0 ,, (2^m4), three balls.
,, 8·3 ,, (2^m5), two balls over a cylinder.
,, 8·6 ,, (2^m6), two balls over a cone.
,, 9·0 ,, (2^m7), a cylinder between two balls.
,, 9·3 ,, (2^m8), a ball over two cylinders.
,, 9·6 ,, (2^m9), a cylinder between a ball and a cone, ball uppermost.
,, 10·0 ,, (3^m0), a cone between two balls.
,, 10·3 ,, (3^m1), a cone between a ball and a cylinder, ball uppermost.
,, 10·6 ,, (3^m2), a ball above two cones.
,, 10·9 ,, (3^m3), a cylinder above two balls.
,, 11·0 ,, (3^m4), a ball between two cylinders.
,, 11·3 ,, (3^m5), a ball between a cylinder and a cone, cylinder uppermost.
,, 11·6 ,, (3^m6), two cylinders over a ball.
,, 12·0 ,, (3^m7), three cylinders.
,, 12·3 ,, (3^m8), two cylinders over a cone.
,, 12·6 ,, (3^m9), a cone between a cylinder and a ball, cylinder uppermost.
,, 13·0 ,, (4^m0), a cone between two cylinders.
,, 13·3 ,, (4^m1), a cylinder over two cones.
,, 13·6 ,, (4^m2), a cone over two balls.
,, 14·0 ,, (4^m3), a ball between a cone and a cylinder, cone uppermost.
,, 14·3 ,, (4^m4), a ball between two cones.
,, 14·6 ,, (4^m5), a cylinder between a cone and a ball, cone uppermost.
,, 15·0 ,, (4^m6), a cone over two cylinders.
,, 15·3 ,, (4^m7), a cylinder between two cones.
,, 15·6 ,, (4^m8), two cones over a ball.
,, 16·0 ,, (4^m9), two cones over a cylinder.
,, 16·3 ,, (5^m0), *and over*, three cones.

All shapes are black and are disposed vertically.

By night:

the ball is replaced by a *white* light, the cylinder by a *red* light, and the cone by a *green* light.

Charts 2720, 2414.

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Chart 999.

Anchorages.—Vessels intending to cross the bar generally anchor about 2 miles southward of the bar lighthouse; they may also anchor off Ko Sichang (*see* page 208), or during the North-east monsoon under the lee of Hlaem Som Muk (page 207), where cargo can be worked by lighters at this season.

Vessels wishing to anchor inside the entrance should do so off the point on the eastern side of the river about 1½ miles northward of Fort Phra Chula Chom Klao (*Lat. 13° 32′ N., Long. 100° 35′ E.*).

Directions.—Approaching the bar of Maenam Chao Phraya from southward, in the North-east monsoon, it will be necessary when near the head of the gulf to allow for a west-going current which occasionally runs with considerable strength along the edge of the bank.

On the western entrance point of Maenam Chao Phraya there is a clump of trees, the tops of which are about 30 feet (9m1) above the surrounding mangroves. Southward of the trees is Fort Phra Chula Chom Klao, visible about 7 miles. The trees will usually be the first object seen from the offing; in hazy weather the bar lighthouse or the pilot vessel outside the bar will be the only marks visible.

Vessels should not attempt to cross the bar without local knowledge.

Whenever two vessels are approaching the river entrance so that they are likely to pass each other abreast of the sunken junks, the vessel proceeding against the tidal stream must stop and allow the other to pass.

The bar should be crossed with a good speed, and the boiler feeds kept closed as much as possible. The in-going stream sets westward or across the bar channel.

See Thailand navigation laws, pages 28-31.

Tidal streams.—Tidal predictions for Bangkok bar are published in the Admiralty Tide Tables.

Outside the bar and near the anchorage in approximately lat. 13° 25′ N., long. 100° 36′ E., the tidal streams set north-westerly on the rising tide and south-easterly on the falling tide, attaining rates of from a quarter of a knot to one knot. During the North-east monsoon the current occasionally sets westward along the edge of the bank with considerable strength. Inside the bar the flow is the resultant of the tidal streams setting in and out of the river and of the current down the river. The resultant flow is in the direction of the channel and its normal maximum rate is as follows:—

Position		Rate	Position		Rate
Lat.	Long.	Knots	Lat.	Long.	Knots
N	E		N	E	
13° 27′½	100° 36′½	0·5 to 1·0	13° 42′	100° 29′½	2·0 to 2·5
13° 30′½	100° 37′½	0·5 to 2·0	13° 42′½	100° 30′½	2·0 to 2·5
13° 31′½	100° 36′½	1·0 to 2·0	13° 44′	100° 30′½	2·5 to 3·5
13° 32′½	100° 36′	1·0 to 3·0	Grand Palace–Bangkok		1·5 to 2·0
Samut Prakan		1·0 to 2·0	13° 46′	100° 30′	1·5 to 2·5
13° 40′½	100° 31′½	1·0 to 2·5	13° 48′½	100° 31′½	1·0 to 2·0

Charts 2720, 2414.

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Chart 999.

The flow at the first two or three stations may be affected by the currents at sea outside the bar. At Bangkok, the tidal stream is usually weaker than the river current from September to December; during this period the flow is almost continuously towards the sea. Occasionally during the rainy season it may rise to 4 or 5 knots.

River above the bar.—The town of Samut Prakan, which had a population of about 6,500 in 1945, is situated on the eastern bank of the river about 3½ miles north-north-eastward of Fort Phra Chula Chom Klao. Vessels must stop at Samut Prakan in order to embark a Customs officer. There is a quarantine station here.

Samut Prakan is connected to the general railway and telegraph systems.

Fresh provisions may be obtained by vessels from Samut Prakan.

An islet, on which is Fort Phisua Samut, lies close off the western bank abreast Samut Prakan. A bank, with depths of less than one fathom (1m8) over it, extends about one mile southward and 2 cables eastward from the islet. A submarine telegraph cable, marked at each end by a white disc on a post, connects Samut Prakan with this islet; vessels are prohibited from anchoring within half a cable of the telegraph cable. *See* Navigation laws, page 31.

A shoal, with a depth of 16 feet (4m9) over it, lies near mid-stream about half a mile farther northward.

The town of Phra Pradaeng stands on the western bank about 5½ miles above Samut Prakan. About half a mile southward of Phra Pradaeng is the entrance to a canal, available for boats, which leads to the river about 1½ miles northward, thus cutting off a large bend. The canal is closed during the rains. The southern limit of Bangkok harbour lies about half a mile north-westward of the northern end of this canal.

The river banks are lined with trees in the lower portions of the river.

Khlong Toei wharf, situated on the east bank of the river about 6 miles below the southern harbour limit, under construction, in 1949, has depths of from 17 to 23 feet (5m2 to 7m0) alongside, with a total berthing space of 2,600 feet (792m5), of which 2,100 feet (640m1) at the northern end have been dredged to a depth of 20 feet (6m1). The wharf is connected to the railway system. There is one travelling crane, with a lifting capacity of 5 tons.

The stretch of harbour above the Grand Palace is normally reserved for Thai men-of-war. A line of mooring buoys in the middle of the river extends about 2 miles above the palace.

Chart 999, plan of Bangkok harbour.

Bangkok harbour.—The harbour of Bangkok lies between the following limits: on the north, a straight line from the obelisk above the mouth of Klong Bang Krabu drawn in a north-westerly direction to the opposite bank of the river, about 3 miles above the Grand Palace; on the south, a straight line from the obelisk above the mouth of Klong Bang Lampu drawn in a north-easterly direction to the obelisk on the opposite bank of the river, about 6 miles below the Grand Palace (*Lat. 13° 45′ N., Long. 100° 30′ E.*). These limits are indicated by pecked lines on the chart.

Climatic table.—*See* page 55.

Anchorage.—Vessels not berthed alongside the wharves moor in

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Chart 999, plan of Bangkok harbour.

mid-river. The depths alongside the wharves are sufficient for all vessels able to cross the bar.

Caution.—A quantity of floating matter is brought down by the freshets in the rainy season, and the stream runs at a rate of from 4 to 5 knots at times.

Quarantine and Dangerous goods anchorages.—The Dangerous goods and quarantine anchorages lie from three-quarters of a mile to 1½ miles above the southern limit of the harbour; they are indicated on the chart.

Prohibited anchorages.—Anchorage is prohibited in the bends of the river as indicated by pecked lines on the chart.

Vessels are prohibited from anchoring near the line of the submarine power cables across the river. The position of each is indicated on the chart and marked by signboards (with an arrow pointing in the direction of the cable) on both sides of the river. Behind these boards are white discs on posts; the post and board in line indicate the direction of the cable.

No sea-going vessel may anchor in the space reserved for Thai vessels of war, indicated by pecked lines on the chart.

Harbour regulations.—The details of the harbour regulations will be found in the copy of the navigation laws supplied on arrival (*see* page 28). The vessel is berthed by the Harbour master, and must not shift berth without permission, and when requiring a berth or to shift berth she must hoist flag T of the International Code of Signals, when the Harbour master will attend.

A vessel requiring the assistance of the police shall hoist the International Code signal YN, or, if there is a mutiny on board, the signal YF.

The harbour fairway is divided into two parts, the eastern and the western, by the vessels moored in mid-stream. The eastern or main fairway is to be used by all steamers and all sailing vessels of more than 50 tons, and the western fairway by all others.

Chart 999.

A steamer dropping down within the harbour limits shall display flag G of the International Code forward; and when another steamer is coming with the tidal stream shall keep in mid-stream, or as close as possible to the vessels moored in mid-stream, until she has been passed.

When a vessel is being undocked or leaving a slipway, a black ball is displayed at the dock or slipway entrance, and at night a *red* light is exhibited.

Bangkok.—Bangkok (*Lat. 13° 45′ N., Long. 100° 30′ E.*) is the capital and seat of commerce of the kingdom of Thailand.

The western bank of the river is chiefly occupied by the naval dock-yard, wharves and godowns. On the eastern bank of the river is the city proper, occupying a space about 3 miles long, traversed by canals and surrounded by battlements flanked by towers in places. Here are the Royal palaces and most of the public offices. South of the city proper is the commercial quarter, where are some of the Legations and Consulates. The Grand Palace and the temples are magnificent and on a large scale, the architecture being of a kind peculiar to the country.

There is a bridge with a movable central span over the river about

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Chart 999.

5½ miles above the southern limit of the harbour. Between this bridge and the southern limit, the harbour is divided into sections, as indicated by pecked lines on the chart. On both banks are rice-mills, wharves and godowns. The names of the wharves are subject to frequent changes, but the correct names can be obtained from the Harbour Master.

The population of Bangkok, including Thomburi, on the opposite bank of the river, and other suburbs, in 1949, exceeded 1,000,000, including about 400,000 Chinese.

Trade.—Shipping.—The principal exports are rice, rubber and teak; the chief imports are manufactured articles, machinery and processed goods.

In 1937-38, 824 vessels of 1,112,574 metric tons entered the port.

Communication.—Radio station.—There is frequent steamer communication with Hong Kong, Singapore, and ports in the Gulf of Thailand and the East coast of the Malay peninsula.

Bangkok is connected to the general telegraph system.

There is a radio station at Bangkok, *see* page 28.

For railway communications *see* page 5.

There is a regular air service with Europe, Singapore and Hong Kong.

A service of motor boats runs as a ferry from the tram terminus to Phra Pradaeng. These boats will stop off any vessel to pick up or put down passengers, the call flag being a red pendant with three white crosses, horizontally disposed.

Consuls.—Besides the British Ambassador Extraordinary and Plenipotentiary there are British Consular officers at Bangkok (*Lat. 13° 45′ N., Long. 100° 30′ E.*).

Port facilities.—Fresh provisions and other supplies are abundant.

Water is laid on to the wharves or can be supplied from tank boats.

A large supply of coal is usually kept in stock. Vessels are coaled from lighters at a rate of about 30 tons per hour, or at the wharves.

A supply of fuel oil is kept at Khlong Toei wharf.

Repairs to vessels can be carried out.

There are four dry docks at Bangkok; details of the largest one are given in Appendix I.

At the Bangkok Dock Company's wharf there are some sheerlegs, with a lifting capacity of 25 tons, one travelling crane of 5 tons and one of 2 tons. There are about 5,300 feet (1,615^{m}4) of wharves, with depths of from 13 to 20 feet (4^{m}0 to 6^{m}1) alongside.

Quarantine.—Health.—For information concerning quarantine *see* page 31.

There is usually a small outbreak of cholera in the months of March, April and May; dysentery is prevalent. The use of river water for drinking should be avoided.

There are two hospitals for Europeans.

Chart 2414.

EASTERN SHORE.—General remarks.—The eastern shore of the Gulf of Thailand consists of the south-western coast of South Viet-Nam, the coast of Cambodia, and part of the coast of Thailand. The coast is much indented and numerous rivers discharge through it. There are numerous islands and off-lying dangers.

Charts 2414, 2660a, 1263.

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Chart 2723.

Coast.—Off-lying banks and islands.—Pointe Camau (Kamau) (*Lat. 8° 36′ N., Long. 104° 42′ E.*), the south-western extremity of South Viet-Nam, is low and covered with trees, the bank fringing it is reported to be extending, and vessels should round the point at a distance of at least 12 miles. Eastward of Pointe Camau, for a distance of about 17 miles, depths of less than 5 fathoms (9m1) extend from 5 to 7½ miles offshore.

Marsh reef, consisting of rocks, with a depth of less than 6 feet (1m8) over them, lies about 9 miles south-eastward of Pointe Camau and about 3¾ miles offshore.

Pulau Obi (*see* page 168), with several off-lying islets, lies about 11½ miles south-eastward of Pointe Camau, and about 7 miles offshore. Two shoals, one with a depth of 2¾ fathoms (5m0) over it, and the other with a depth of 2¼ fathoms (4m1), lie about 5 and 9 miles, respectively, eastward of Pulau Obi. Vessels should not attempt to pass between Pointe Camau and Pulau Obi.

Chart 2414.

Royalist bank, with a depth of 6 fathoms (11m0) over it, lies about 27 miles south-eastward of Pulau Obi. Another bank, with a depth of 6 fathoms (11m0) over it, lies about 20 miles east-north-eastward of Royalist bank.

An extensive bank, which has not been surveyed and has depths of from 8 to 10 fathoms (14m6 to 18m3) over it, lies about 70 miles west-south-westward of Pointe Camau (*Lat. 8° 36′ N., Long. 104° 42′ E.*).

Chart 2723.

An obstruction was reported, in 1914, by the *Heijun* Maru, to lie about 18 miles west-south-westward of Pointe Camau, but it was searched for unsuccessfully in 1917.

Two shoals, each with a depth of 2 fathoms (3m7) over it, lie about 6 miles southward and 4½ miles south-westward of Pointe Camau, and a 2½-fathom (4m6) patch lies about 6 miles south-south-westward of the same point. Shoals, with depths of one fathom and 1¼ fathoms (1m8 and 2m3) over them, lie about 6½ and 5 miles westward, respectively, of Pointe Camau. Northward of the point the depths are more regular.

There are numerous fishing stakes on the coastal bank westward of Pointe Camau.

Hon Buong (Rocky island), 161 feet (49m1) high, lies about 19 miles north-north-westward of Pointe Camau and about 14 miles offshore. A ledge of rocks extends about a quarter of a mile eastward from the island.

Faux Îlot (False Pulo) Obi, 489 feet (149m0) high and wooded, lies about 4 miles north-north-westward of Hon Buong; it is cliffy, steep-to, and has the appearance of two islands from southward.

Between Pointe Camau and Mui Ba Kwau, about 14 miles north-eastward, is the entrance to a shallow bay, at the head of which is the mouth of Song Kua Lon (Kamao river). The mouth of Song Baĭ Hap is in the northern part of the bay, about 4 miles eastward of its northern entrance point. The bar, which extends about 4 miles from the mouths of these rivers, almost dries, is covered with fishing stakes, and is continually extending.

Song Ong Dok discharges into the Gulf of Thailand about 15 miles northward of Mui Ba Kwau. It is navigable by junks drawing 6 feet (1m8).

Charts 2660a, 1263.

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Chart 2723.

Les Mamelles (The Paps) (*Lat. 9° 10′ N., Long. 104° 47′ E.*), two small rocky bluffs, 100 feet (30^{m}5) high, lie on the coast about 23 miles northward of Mui Ba Kwau ; with this exception, between the latter and a point about 50 miles northward, the coast is low, and several streams flow through it.

Chart 2723, with plan of Pulo Obi.

Pulau Obi.—Off-lying islets and rock.—Light.—Pulau Obi is 1,046 feet (318^{m}8) high at its southern end, and densely wooded. Its north-western side is indented by two bays, and its south-eastern side by another bay. In 1948, a house with a red roof stood at the head of the southern of the two bays on the north-western side of the island. *See* view facing page 60.

Pulau Obi, bearing 033°, distant 6 miles.
(*Original dated* 1933.)

A bank, with depths of from 2 to 5 fathoms (3^{m}7 to 9^{m}1) over it, mud, extends about 1½ miles from its north-western side, and there are several detached patches, with depths of from 3¾ to 4¾ fathoms (6^{m}9 to 8^{m}7) over them, lying within three-quarters of a mile of the outer edge of the bank. A bank, with depths of less than 5 fathoms (9^{m}1) over it, rock, extends about 1½ miles from the head of the bay on the eastern side of the island.

Two 2¾-fathom (5^{m}0) patches lie about one mile west-south-westward and 6 cables south-westward, respectively, of the western extremity of Pulau Obi (*Lat. 8° 26′ N., Long. 104° 49′ E.*).

H.M.S. *Britomart*, in 1902, reported that depths of from 5 to 5½ fathoms (9^{m}1 to 10^{m}1) existed from a position about one mile southward of Pulau Obi to a position about 6 miles westward of that island, where greater depths are shown on the chart.

A light is exhibited, at an elevation of 984 feet (299^{m}9), from a white tower and dwelling, about 54 feet (16^{m}5) in height, on the eastern side of the summit of Pulau Obi. In 1946, this light was extinguished.

Hon doi moi (North island) lies close off the northern extremity of Pulau Obi, with a rock, with a depth of less than 6 feet (1^{m}8) over it, between them. Hon Sao, an islet, 541 feet (164^{m}9) high and wooded, lies about three-quarters of a mile south-eastward of Pulau Obi. In 1949 less water was reported in the channel between them.

Hon Go, an islet, 118 feet (36^{m}0) high and wooded, lies about 2 cables east-north-eastward of Hon Sao. Hull rock, 32 feet (9^{m}8) high, with a rock, with a depth of less than 6 feet (1^{m}8) over it, close south-westward of it, lies about 2½ miles south-eastward of Hon Sao.

Anchorages.—Small vessels with local knowledge can anchor in the bays on either side of Pulau Obi, according to the monsoon, about half a mile offshore. Larger vessels should anchor farther off. The depths near the anchorages were reported, in 1904, to have one fathom (1^{m}8) less depth than that shown on the chart.

In 1940, the French vessel *Amiral Charner* anchored in a depth of about 10 fathoms (18^{m}3), with good holding ground, about one mile west-south-westward of Hon Sao.

Tidal streams.—Eastward of Palau Obi, the flow on the rising

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Chart 2723, with plan of Pulo Obi.

tide sets north-westward, and on the falling tide south-eastward. The rate may occasionally exceed 1½ knots.

Charts 2722, 2723.

Outlying islands and rocks.—Dangers.—Several islands and dangers lie out a considerable distance from the eastern shore of the Gulf of Thailand; those farthest from the coast are Pulau Panjang, which lies about 84 miles north-westward of Pointe Camau, and Pulau Wai (page 184), about 50 miles north-westward of Pulau Panjang.

Chart 2101, plan of Pulo Panjang.

Pulau Panjang (*Lat. 9° 18′ N., Long. 103° 28′ E.*), of a nearly uniform elevation of 545 feet (166m1), has the appearance of a table-land from every direction. On the western side of the island, which is inhabited, there is a bay which affords shelter and good anchorage during the North-east monsoon; a rock, 2 feet (0m6) high, with others, with a depth of less than 6 feet (1m8) over them, close eastward and westward of it, lies about half a mile south-westward of the northern entrance point of the bay. Île du Pic (Peak island) lies about 2 cables off the southern extremity of Pulau Panjang, with foul ground between.

A shoal, with a depth of 2¾ fathoms (5m0) over it, lies about 3 cables southward of Île du Pic. Rajanattianuhar reef consists of two heads of rock, with a depth of 4 feet (1m2) over them, surrounded by a fringe of coral which is steep-to, lying about three-quarters of a mile southward of Île du Pic. Rocher Blanc (White rock), 75 feet (22m9) high, lies about 1½ miles south-south-westward of Île du Pic.

Two islets lie east-north-eastward of Pulau Panjang, one, 200 feet (61m0) high, at a distance of about three-quarters of a mile and the other, 150 feet (45m7) high, about 3 cables farther north-eastward. An obstruction was reported, in 1927, by s.s. *Daviken*, to lie about 2½ cables south-westward of the former of these two islets, and rocks, with depths of less than 6 feet (1m8) over them, extend a short distance from the north-eastern side of the same islet.

The passage between Pulau Panjang and the islet east-north-eastward of it, and that between the latter and the 150-foot (45m7) islet are obstructed by coral.

Îlot de l'Est (East island), 105 feet (32m0) high, and Rocher Table, 36 feet (11m0) high, about a quarter of a mile south-eastward, lie about 8½ miles north-eastward of Pulau Panjang.

Chart 2722.

The master of s.s. *Dewagougse*, in 1888, reported a shoal, with a depth of 3 fathoms (5m5) over it, and on which that vessel struck, situated about 17 miles north-north-westward of Pulau Panjang.

Chart 2101, plan of Pulo Panjang.

Anchorage.—The bay on the western side of Pulau Panjang affords shelter and good anchorage during the North-east monsoon, in a depth of 16 fathoms (29m3), mud and coral, about 6½ cables east-south-eastward of the rock, 2 feet (0m6) high.

Charts 2723, with plan of Pulo Dama anchorage, 2725.

Approach to Baie du Rach-Gia.—Islands and dangers.—Several islands and dangers lie in the approach to Baie du Rach-Gia (page 172); the Pulau Dama group (page 170) is situated about 55 miles north-eastward of Pulau Panjang, and about 26 miles offshore. Tammassou (Tammassu) (page 171), an island, lies about 13 miles north-eastward of the Pulau Dama group, and another island, named

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Charts 2723, with plan of Pulo Dama anchorage, 2725.

Tecksu (Teksu) lies about 13 miles north-eastward of Tammassou and nearly midway between the entrance points of Baie du Rach-Gia.

A rock, with a depth of less than 6 feet (1m8) over it, lies in the southern approach to Baie du Rach-Gia, about 3¾ miles offshore and 12 miles south-eastward of Tammassou.

Hon Nam Du (*Lat. 9° 41′ N., Long. 104° 20′ E.*) is the principal island of the Pulau Dama group. It has a sharp peak, 1,015 feet (309m4) high, near its centre, and on its eastern side, about 1½ miles from its southern extremity, is a monument. Three islets lie within 1½ miles southward of Hon Nam Du ; the inner one is named Hon Hoa Lu and is 315 feet (96m0) high, the middle one is named Hon To Yen, and the outer one, Hon Mongtay (Mongtai), is 340 feet (103m6) high.

A rock, 4 feet (1m2) high, lies about 1¼ cables southward of Hon Mongtay, and a shoal, with a depth of 2½ fathoms (4m6) over it, and steep-to, lies about one cable farther southward.

Chart 2725.

Hon Colon (Kolon) lies about half a mile westward of the northern end of Hon Nam Du, with another islet close southward of it ; both lie outside the entrance of a small bay by which the north-western end of Hon Nam Du is indented. There is a rock, with a depth of 2¾ fathoms (5m0) over it, which lies about one mile south-south-westward of the northern extremity of Hon Nam Du and about 2 cables off the southern entrance point of the above-mentioned bay. A shoal, with a depth of 4¾ fathoms (8m7) over it, lies nearly midway between the entrance points.

A rock, with a depth of 3 feet (0m9) over it, lies about 1¼ miles westward of the 1,015-foot (309m4) summit of Hon Nam Du. There is an obstruction close offshore about three-quarters of a mile east-south-eastward of this rock, and another obstruction about half a cable south-eastward of the same rock.

Charts 2723, with plan of Pulo Dama anchorage, 2725.

Hon Moc (Mok), 345 feet (105m2) high, lies about 4 cables northward of Hon Nam Du, with a rock, with a depth of 4 feet (1m2) over it, in the passage between them. An islet, 155 feet (47m2) high, with a rock above water about a quarter of a mile westward of it, lies about half a mile west-north-westward of Hon Moc, and two 5-fathom (9m1) patches lie about 4 and 6 cables, respectively, eastward of the southern end of the latter.

Hon Gian, the northernmost island of the group, 345 feet (105m2) high, lies about half a mile north-eastward of Hon Moc. A bank, with depths of less than 3 fathoms (5m5) over it, extends about 1¼ cables from the northern side of Hon Gian, and a bank, with depths of less than 5 fathoms (9m1) over it, extends about 2 cables southward and eastward from the island.

Hon Nhom, an islet, 195 feet (59m4) high, lies about 4 cables eastward of the northern end of Hon Nam Du, with a 1¾-fathom (3m2) patch close off its western side.

A bank, with depths of less than 5 fathoms (9m1) over it, extends about 3 miles eastward and south-eastward from Hon Nam Du. Near the eastern edge of the bank is a chain of islets, between which and Hon Nam Du are two 3-fathom (5m5) patches, situated about 1¼ miles east-north-eastward and the same distance eastward, respectively, of the summit of Hon Nam Du.

Charts 2414, 2660a, 1263.

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Charts 2723, with plan of Pulo Dama anchorage, 2725.

Hon Mau (*Lat. 9° 38′ N., Long. 104° 23′ E.*), the southernmost of the eastern chain of islets, lies about 2½ miles south-eastward of the southern extremity of Hon Nam Du.

Hon Botra, 295 feet (89m9) high, lies about three-quarters of a mile north-north-westward of Hon Mau; a bank, with depths of less than 3 fathoms (5m5) over it, extends about 1¼ cables from its south-eastern side, and an islet lies close off its southern extremity, with another islet about 6 cables east-north-eastward.

Hon Dhau lies about a quarter of a mile north-eastward of Hon Botra; a bank, with depths of less than 3 fathoms (5m5) over it, extends about 3½ cables westward from the southern end of Hon Dhau, and near its western edge are some islets, the south-easternmost of which is 2 feet (0m6) high. A bank, with depths of less than 3 fathoms (5m5) over it, extends about 1½ cables westward from the northern end of the same island; a similar bank, on which are two islets, extends about three-quarters of a mile northward from the island.

Chart 2723, with plan of Pulo Dama anchorage.

Hon Truong, 345 feet (105m2) high, lies about 6 cables north-westward of Hon Dhau. A bank, with depths of less than 3 fathoms (5m5) over it, extends about 2¼ cables south-eastward from its south-western end, and the north-western side of the island is fringed by a reef. An islet, 165 feet (50m3) high, lies close off the southern extremity of the same island.

Hon Truoc (Truok), 295 feet (89m9) high, is the northernmost of the eastern chain of islets and lies about 1¼ miles eastward of the northern end of Hon Nam Du. Roche de l'Aspic, with a depth of 2 feet (0m6) over it, lies about 3 cables north-north-eastward of Hon Truoc. Another rock, awash, lies about 2 cables north-westward of Roche de l'Aspic.

Chart 2723.

Tammassou (page 169) is 1,327 feet (404m5) high, table-topped and wooded; the sides of its summit are very cliffy. A pinnacle rock, with a depth of 2 feet (0m6) over it, lies about a quarter of a mile from the western extremity of the island; vessels should not pass between this rock and the island. Several shoals, with a depth of less than 5 fathoms (9m1) over them, lie within a radius of 5 miles of Tammassou; the shoalest of these, with a depth of 1¾ fathoms (3m2) over it, lies about one mile southward of the island, but its existence is doubtful.

Tecksu (page 170) is cone-shaped and 1,294 feet (394m4) high; it lies near the edge of a mud flat which extends about 15 miles from the head of Baie du Rach-Gia. A rock, over which there is a depth of 2½ fathoms (4m6), lies about 3 miles westward of the southern extremity of the island, but its existence is doubtful. There is a plantation at the southern end of Tecksu.

Chart 2723, with plan of Pulo Dama anchorage.

Anchorages.—In the Pulau Dama group, during the South-west monsoon, the best anchorage for vessels with local knowledge is eastward of the summit of Hon Nam Du, with the eastern extremity of Hon Nhom in line with the southern extremity of Hon Gian, bearing 345°, in a depth of about 4 fathoms (7m3); the holding ground is good, but squalls come off the high land. During the North-east monsoon there is anchorage about 5½ cables south-westward of the western extremity of Hon Mau, in a depth of about 7 fathoms (12m8).

Charts 2414, 2660a, 1263.

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Chart 2725.

Anchorage may also be obtained by vessels with local knowledge in the entrance to the bay on the north-western side of Hon Nam Du (*Lat. 9° 41′ N., Long. 104° 21′ E.*), but the rock, with a depth of 2¾ fathoms (5m0) over it, which lies in the southern part of the entrance to the bay, previously mentioned, should be avoided. There is also anchorage off the beach on the south-western side of Hon Nam Du. *Chart 2723.*

Small vessels with local knowledge can anchor in fine weather off the bay on the southern side of Tammassou, in a depth of 2¾ fathoms (5m0).

Vessels with local knowledge can find temporary anchorage off the plantation on Tecksu.

Baie du Rach-Gia.—Light.—Baie du Rach-Gia is entered between Le pic Tecksia, 800 feet (243m8) high and cone-shaped, situated about 7 miles north-north-eastward of Tecksu, and a point on the mainland about 17 miles southward. There are depths of less than 2 fathoms (3m7) in this bay.

The mouth of Song Cailon (Kailon) is situated in the south-eastern part of Baie du Rach-Gia. There is a depth of only 3 feet (0m9) at high water over the bar; within the bar, under favourable circumstances, vessels drawing 6 feet (1m8) can reach Le Mékong (page 213) and Saïgon (page 228) by inland waterways.

The mouth of Rivière Rach-Gia is situated about 12 miles south-eastward of Le pic Tecksia. The bar of the river dries at very low tides; the tidal stream over the bar sometimes attains a rate of from 3 to 4 knots.

The port of Rach-Gia consists of a canal, entered between two moles extending west-south-westward; the moles consist of rows of wooden piles, and the channel between them is 150 feet (45m7) wide. There is a jetty at which river steamers lie alongside, and there are quays on both sides of the canal within the moles.

The town of Rach-Gia, in which there is a Custom house, with a flagstaff, stands near the mouth of the river.

A light is exhibited, at an elevation of 56 feet (17m1), from a black pylon, about 56 feet (17m1) in height, situated near the Custom house at Rach-Gia. Within this light-structure the entrance to the river is marked by lights.

Tidal streams.—The flow over the bar sometimes attains a rate of 3 or 4 knots, and in the season of high river (May to October) the flow always sets seaward; in the low river season the flow usually changes direction, though the out-going flow is stronger than the in-going. Slack water lasts barely a quarter of an hour, but its time may vary by several hours from one day to another.

Communication.—Rach-Gia is connected to the general telegraph system.

A canal, navigable by boats drawing 6 feet (1m8), connects Rach-Gia with Hatien (page 175) and with Long Xuyen (Chó long Xuyen), situated on a branch of Le Mékong, about 34 miles north-eastward (*see* chart 2414).

Coast.—Baie de Cay Duong, which is shallow and sandy, is entered between Le pic Tecksia and Cap de la Table, a rocky headland, 604 feet (184m1) high, about 14½ miles west-north-westward; some rocky hills, 720 feet (219m5) high, lie just within the headland. Some rocks,

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Chart 2723.

above water, lie close south-westward of Cap de la Table. A rock, 4 feet (1m2) high, with a rock, with a depth of less than 6 feet (1m8) over it, about 6 cables south-westward, lies about 4½ miles south-eastward of Cap de la Table. Several rivulets discharge into Baie du Cay Duong.

Cap Ong Thay (tai) lies about 2 miles westward of Cap de la Table; a range of mountains extends about 3 miles north-eastward from the cape.

Charts 2725, 2723.

Îlots Balua.—Dangers.—Îlots Balua is the largest and outermost group of islands off-lying Cap Ong Thay.

Tekere or Hon Minghue (*Lat. 10° 01′ N., Long. 104° 32′ E.*), a cone-shaped island, 1,120 feet (341m4) high, wooded and inhabited, is the largest of Îlots Balua, and lies about 7 miles south-south-westward of Cap Ong Thay. A rock, above water, lies about a quarter of a mile southward of the island, and there is a 1¾-fathom (3m2) patch 2 cables off its northern extremity. A shoal, with a depth of 2¾ fathoms (5m0) over it, lies about 1¼ miles east-north-eastward of the eastern extremity of the island, and a 2¼-fathom (4m1) patch lies about 1¾ miles farther eastward.

Chart 2725.

Île du Large (Outer island) lies about 4 miles south-westward of Tekere; depths of 5 fathoms (9m1) and possibly less extend 3 miles south-westward from this islet. A shoal, on which s.s. *Donai* was reported to have touched bottom, in 1898, lies about 9½ miles westward of Île du Large, but a subsequent examination failed to discover a depth of less than 26 feet (7m9). Île Escarpée (Shark island) lies about 4½ miles westward of Tekere; two patches, with a depth of 3 fathoms (5m5) over them, lie about 5 miles westward of Île Escarpée. Rocher Arbre (Tree rock) lies about 2¼ miles northward of Île Escarpée. Rocher du Mékong, with a depth of 6 feet (1m8) over it, lies about 1¼ miles south-westward of Rocher Arbre. Rocher Selle (Saddle rock) lies nearly one mile northward of Rocher Arbre. A rock, which dries about 2 feet (0m6), lies close south-eastward of Rocher Selle. Île de l'Ouest (West island) lies about 6 miles north-westward of Rocher Selle; a shoal, with a depth of 3 fathoms (5m5) over it, lies about 2½ miles south-south-westward of Île de l'Ouest.

Hon Heo, an inhabited island, lies about 4½ miles north-westward of Cap Ong Thay, and is the northernmost of Îlots Balua; a shoal, with a depth of 3 fathoms (5m5) over it, lies about 2¾ miles westward of Hon Heo, with rocks, both above and below water, between it and the island. An islet, named Hon Nhum Mot, lies about 1¼ miles south-south-eastward of Hon Heo, and several islets extend about 2 miles south-south-westward from Hon Nhum Mot. A chain of islets and dangers extends southward and south-south-westward from Hon Heo nearly as far as Rocher Arbre and Rocher Selle, the positions of which can best be seen on the chart.

Many of the islets and dangers which exist in the vicinity of Îlots Balua are not shown on the charts as the locality has not been accurately surveyed. No vessel should attempt to navigate near the islands without local knowledge.

Chart 2723.

Islands in approach to Hong Chong.—Hon Re Lon lies about

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Chart 2723.

1¼ miles west-north-westward of Cap Ong Thay. Hon Re Nho lies about a quarter of a mile eastward of Hon Re Lon and about half a mile offshore. A detached shoal, with a depth of 2 fathoms (3m7) over it, lies nearly midway between Hon Re Lon and Hon Nhum Mot.

Îles Da Lua form a small group lying about three-quarters of a mile northward of Hon Re Lon and about the same distance westward of Îlot Lae (*Lat. 10° 10′ N., Long. 104° 34′ E.*).

Hong Chong.—A bay is entered between Cap Ong Thay and Nui Nguon (Ngun), a rocky headland, about 1¼ miles northward. The town of Hong Chong stands near the head of this bay, and there is a landing pier in the southern part of the bay. Northward of Hong Chong the shore of the bay is low.

Nui Nuoc (Nuok), a rocky headland, lies midway between Nui Nguon and Nui Loc Coc (Log Kok), a rocky headland, about 1½ miles north-north-westward, dividing the coast into two small bays, the shores of which are low. Îlot Lae lies close southward of Nui Nuoc, in the entrance of the southern bay.

Hong Chong is of some importance for the export of pepper in junks during the North-east monsoon. The town is connected to the general telegraph system.

There is regular steamer communication with Hatien, Kampot and the island of Phu Quoc (Kwok).

Supplies of beef and fruit are obtainable.

Anchorages.—During the North-east monsoon, small vessels with local knowledge anchor close off Hong Chong, according to draught; there is no greater depth than 2 fathoms (3m7) off the town. The holding ground is good in a depth of 2¾ fathoms (5m0), in a position about 3 cables north-westward of Cap Ong Thay and landing can be effected at the pier in the bay.

During the South-west monsoon the anchorages are untenable, and the sea breaks around the islets in the offing, but there is some slight shelter for small craft under Hon Heo.

Charts 2725, 2723.

Coast.—Light.—About 5 miles north-westward of Nui Loc Coc there is a point, close south-westward of which there is an islet. About 1½ miles south-south-westward of this islet is another islet, and about 9 cables farther in the same direction is a rock, with a depth of less than 6 feet (1m8) over it.

Baie de Thuan Yen is entered between the last-mentioned point and Pointe Nui Nai, about 7½ miles north-westward. Rivière de Caneao (Kankao) or Hatien discharges into the northern end of the bay, and on its western entrance point is the town of Hatien. Between Cap Ong Thay and Pointe Nui Nai, a bank, with depths of less than 3 fathoms (5m5) over it, extends from about 3½ to 5 miles offshore.

Chart 2725.

A light is exhibited, at an elevation of 203 feet (61m9), from a masonry tower, about 25 feet (7m6) in height, on a dwelling on Pointe Nui Nai.

Rivière de Caneao.—Rade d'Hatien.—Lights.—Danger.—Pointe Phao (Fao) Dai, the western entrance point of Rivière de Caneao, lies about 2½ miles east-north-eastward of Pointe Nui Nai. Mirador, a hill, 203 feet (61m9) high, lies about 9 cables northward of Pointe Phao Dai, and Nui To Chau Lon, 407 feet (124m0) high, lies about

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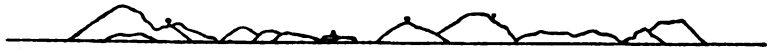
Chart 2725.

a quarter of a mile eastward of the eastern entrance point. These hills together with the gap between them are remarkable from south-westward.



Mirador hill.

Mouth of Rivière de Caneao from south-westward.

(*Original dated* 1933.)

Numerous fishing stakes, some of which carry red flags, are met with in the approach to the river, between Îlots Balua and Îles Pirates (*see* below).

The bar of the river is about half a mile wide; its outer edge being about 1½ miles south-westward of Pointe Phao Dai (*Lat. 10° 22′ N., Long. 104° 28′ E.*). For a distance of about half a cable, there are depths of only 6 feet (1m8) over the bar; the mud is, however, very soft, and vessels drawing 11 feet (3m4), and having sufficient power, can enter the river at half-tide. A bank, with depths of less than 3 fathoms (5m5) over it, extends about 3 miles south-westward from the outer edge of the bar.

A rock, with a depth of 4 feet (1m2) over it, lies in the approach to the bar, nearly one mile south-south-eastward of Nui Nai lighthouse.

Within the entrance is a lake, about 2½ miles long, known as Goulet d' Hatien, most of which dries.

Leading lights are situated near Hatien. The front light is exhibited, at an elevation of 21 feet (6m4), from a red pylon, surmounted by a red disc, about 25 feet (7m6) in height, situated on Pointe Phao Dai; the rear light is exhibited, at an elevation of 41 feet (12m5), from a white and black pylon, surmounted by a white cylinder, about 48 feet (14m6) in height, north-eastward of the front light. These lights are moved as requisite to meet changes in the channel.

Anchorages.—Vessels drawing 20 feet (6m1) are obliged to anchor 1½ miles seaward of Nui Nai lighthouse. Those drawing less water can anchor in a small bay northward of the lighthouse, or in the mouth of the river, in a depth of 13 feet (4m0), with excellent holding ground.

Hatien.—Port facilities.—Hatien is the principal town of a province to which all the French islands in the Gulf of Thailand are attached.

There is a quay and two small jetties on the northern side of the river, and one jetty on the southern side. The quay is about 600 feet (182m9) long, with a depth of about 8 feet (2m4) alongside.

Hatien is connected by canal with Rach-Gia, and thus with the interior. It is connected to the general telegraph system.

The canal, which formerly connected Hatien with Chaudoc, on a branch of the Mékong, was blocked with mud and was unnavigable in 1934.

Fresh provisions are obtainable.

Directions.—Vessels are recommended to approach Hatien by passing between Île de l'Ouest (page 173) and Îles Pirates and thence keeping the leading light-structures in line. No vessel, however, should enter without local knowledge.

Îles Pirates.—Dangers.—Îles Pirates lie on the north-western

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Chart 2725.

side of the approach to Hatien. Pirate du Sud (South Pirate), the southernmost islet of the group, lies about 10 miles south-westward of Pointe Nui Nai; a reef extends about 3 cables northward from the islet.

Hon Tre Lon (Great Pirate) lies about 3½ miles north-north-eastward of Pirate du Sud. A bank, with depths of less than 2 fathoms (3m7) over it, extends about 2 miles southward from Hon Tre Lon. On the western side of this bank are Hon Tre-vinh, Hon Gui, Hon Banh-it, Hon Mu-u, and Hon Cho-ro, and on the south-eastern side, Hon Du-oc, Hon Giong, and Hon U; there are also a number of dangers between the islets. The positions of these islets and dangers can best be seen on the chart.

Rugged rock (*Lat. 10° 21′ N., Long. 104° 16′ E.*), 6 feet (1m8) high, lies about 2½ miles north-westward of Hon Tre Lon. Hon Keo-ngua, with Hon Kien-vang, about 6 cables west-north-westward of it, lies about 2 miles northward of Hon Tre Lon.

Pirate du Nord (North Pirate) lies about 2 miles northward of Hon Keo-ngua. An islet lies about 3 cables south-westward of Pirate du Nord, and three islets lie off its north-eastern side, the outer one at a distance of about a quarter of a mile.

Île du Pic (Peaked island), 507 feet (154m5) high and wooded, is the northernmost of Îles Pirates and lies about 1½ miles northward of Pirate du Nord, and about 2½ miles offshore. Roche du Brandon, a pinnacle with a depth of 3 feet (0m9) over it, lies about 3½ miles westward of Île du Pic and a shoal, with a depth of 1½ fathoms (2m7) over it, lies about one mile north-westward of its south-western extremity. An islet lies about three-quarters of a mile east-south-eastward of Île du Pic, and two islets lie north-eastward of the latter, the outermost at a distance of about 1½ miles.

No vessel should attempt to pass between the islands of the group without local knowledge.

Anchorages.—There is anchorage, in the South-west monsoon, for small vessels with local knowledge, about half a mile eastward of Hon Tre Lon, in a depth of about 3½ fathoms (6m4); also 2 miles eastward of Pirate du Nord, in a depth of about 4 fathoms (7m3).

In the North-east monsoon, there is anchorage under the southern side of Île du Pic, in a depth of about 3 fathoms (5m5).

Coast.—Between Pointe Nui Nai and Pointe Kep, about 11 miles north-westward, the coast is low. Rivière Compong Trach, which is available at high water for junks, discharges into the bight about 5 miles north-north-westward of Pointe Nui Nai; Peam, a town with a Custom house, is situated on the eastern side of the entrance to the river.

Between the mouth of the river and Pointe Kep there are two hills on the coast, one about 2 miles westward of the river mouth, and the other about 5 miles north-westward of it, and a short distance inland.

Pointe Kep is prominent, with Pic Kep, 963 feet (293m5) high, situated about half a mile inland. On the point is a settlement with some villas and a reddish coloured bungalow; about 2 miles east-north-eastward of the settlement there is a Custom house and a small mole. At low water, and also with south-westerly winds, landing is difficult and the stones which extend from the beach should be avoided.

The channel between this stretch of coast and the numerous islands

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Chart 2725.

and dangers off-lying it, which have already been described, is only navigable by vessels of very shallow draught with local knowledge.

Anchorage.—There is anchorage for small vessels with local knowledge about one mile south-eastward of Pointe Kep.

Communication.—The settlement at Pointe Kep is connected to the general telegraph system.

KAMPOT AND APPROACHES.—Kampot (Kamput) is the chief town of the province of the same name, which extends from Pointe Kep (*Lat. 10° 28′ N., Long. 104° 17′ E.*) to the border of Thailand. It stands on the east bank of a river about 3½ miles northward of Cap Bumbi, which lies 7½ miles north-westward of Pointe Kep.

There are two approaches to Kampot, one from the west, known as Chenal Ouest, lying northward of Cap Kwala, the northern extremity of Phu Quoc (Koh Tron), situated about 18 miles westward of Pointe Kep, and one from the south, known as Chenal Sud, lying on the eastern side of Phu Quoc.

Massif de l'Elephant, on the mainland, is very prominent when approaching Kampot. A nipple, 3,194 feet (973^{m}5) high, at the southern end of the range, lies about 10 miles northward of Cap Kwala. Pnom Sor (Bumbi cone), 277 feet (84^{m}4) high, situated about 9 miles north-eastward of the nipple, and Pnom Dong (Paps), 297 feet (90^{m}5) high, about one mile northward of Cap Bumbi, are also prominent from the channel.

Chenal Sud.—Chenal Sud is entered between the Pulau Dama group and Pointe Ong Doi, the south-eastern extremity of Phu Quoc, about 24 miles north-westward. Chenal Sud is only navigable by vessels with a draught of 15 feet (4^{m}6) or less.

Western side of Chenal Sud.—Lights.—Dangers.—On the western side of the entrance to Chenal Sud, a number of islands and rocks extend southward from Phu Quoc, the outermost being a rock, 3 feet (0^{m}9) high, situated about 13 miles southward of Pointe Ong Doi. Rocher Table, about 18 feet (5^{m}5) high, lies about three-quarters of a mile westward of the outermost rock. Frère de l'Ouest (West Brother), 402 feet (122^{m}5) high, lies about 1¼ miles north-eastward of Rocher Table, with a rock, 2 feet (0^{m}6) nigh, about a quarter of a mile westward of it. Frère de l'Est (East Brother), 438 feet (133^{m}5) high, lies about 3 miles north-eastward of Frère de l'Ouest.

Between the last mentioned islets and the Îles d'An Thoï there is a channel about 5 miles wide.

Hon Trang, the south-westernmost of Îles d'An Thoï, lies about 7 miles south-south-westward of Pointe Ong Doi; a reef extends a short distance southward from Hon Trang, and a detached sunken rock, the existence of which is doubtful, is charted one cable southward of the islet. Hon Mong Thay (Thai), the south-easternmost island, lies about 1½ miles eastward of Hon Trang. Hon Kim Qui (Ki), 172 feet (52^{m}4) high, with rocks extending a short distance from its south-western and south-eastern sides, lies about one mile north-westward of Hon Trang. Hon May (Mai) Rut, 283 feet (86^{m}3) high, lies midway between Hon Trang and Hon Kim Qui. A reef, on which is an islet, extends about a quarter of a mile southward from Hon May Rut.

Hon Vong, 119 feet (36^{m}3) high, lies about 3½ cables north-eastward

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Chart 2725.

of Hon May Rut. An islet, surrounded by rocks, lies about half a mile north-westward of Hon Vong (*Lat. 9° 55′ N., Long. 103° 59′ E.*). Hon Gam Ghi, with reefs extending a short distance from its northern side, lies nearly midway between Hon Mong Thay and Hon Vong. Hon Xuong, 244 feet (74m4) high, with reefs extending a short distance from its south-western side, lies about 3½ cables northward of Hon Mong Thay. Hon Vang, 214 feet (65m2) high, with a bank, with depths of less than 2 fathoms (3m7) over it, extending about 4 cables from its western side, lies about 4¼ cables northward of Hon Xuong.

Hon Thom, 326 feet (99m4) high at its southern end, the largest of Îles d'An Thoï, lies about 3½ cables northward of Hon Vang. A bank, with depths of less than 5 fathoms (9m1) over it, extends about one mile eastward from Hon Thom.

Hon Roï, 310 feet (94m5) high at its northern end, lies about 3½ cables north-eastward of Hon Thom. Two shoals lie south-eastward of Hon Roï, the inner one, with a least depth of 4¼ fathoms (7m8) over it, is separated from the islet by a narrow deep channel, the outer shoal, with a depth of 5 fathoms (9m1) over it, lies about 2 miles from the islet.

Hon Dua, 425 feet (129m5) high, lies about 4 cables north-westward of Hon Roï and is separated from the southern end of Phu Quoc by a channel about half a mile wide, the fairway of which is deep. At the north-western extremity of Hon Dua there is a black and white rock.

There are channels, which are apparently deep, between the islands, but they should not be used, as dangers may exist other than those shown on the charts.

Between Pointe Ong Doi and Pointe Hant, about 2½ miles westward, there are two shallow bays; the village of An Thoï stands in the north-western part of the western bay.

A light is exhibited, at an elevation of 131 feet (39m9), from a red framework pylon, about 26 feet (7m9) in height, on Pointe Hant.

Two islets, both 155 feet (47m2) high, lie off the point separating the two bays mentioned above; the north-western islet is named Hon Dam; a prominent white rock lies at the north-western extremity of the south-eastern islet.

Pointe Ong Doi is the south-eastern extremity of Presqu' île aux Singes, which has a rounded summit, 392 feet (119m5) high, and extends about one mile south-eastward from Phu Quoc, to which it is joined by a narrow isthmus. A rocky shoal, with a depth of 2¼ fathoms (4m1) over it, lies about 1½ miles east-south-eastward of Pointe Ong Doi, and a bank, with depths of less than 5 fathoms (9m1) over it, extends about 3 miles farther east-south-eastward. A shoal, with a depth of 2¼ fathoms (4m1) over it, lies about 2 miles north-north-eastward of Pointe Ong Doi.

Between Pointe Ong Doi and Pointe An Yen, about 4 miles northward, there is a bay in the south-eastern side of Phu Quoc. A peaked hill, 549 feet (167m3) high, lies close westward of Pointe An Yen. Baie de Dam is entered between Pointe An Yen and a point about 2 miles northward. About 3¼ miles northward of Pointe An Yen is Pointe Den Phaoh. Baie de Baï Vian is entered between Pointe Den Phaoh and a point about 2 miles northward.

A light is periodically exhibited, at an elevation of 62 feet (18m9), from a white pylon, about 36 feet (11m0) in height, situated on the coast about half a mile north-westward of Pointe den Phaoh.

Charts 2723, 2414, 2660a, 1263.

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Chart 2725.

Le Coin (Quoin), 1,015 feet (309m4) high, lies about 4½ miles northward of Pointe den Phaoh and one mile inland. The village of Ham Ninh, in which there is a Custom house, stands on the coast about one mile south-eastward of Le Coin. Northward of Pointe An Yen, a bank, with depths of less than 5 fathoms (9m1) over it, extends about 3½ miles from the south-eastern side of Phu Quoc.

The eastern side of Phu Quoc, northward of Le Coin, consists of a table-land, at the southern end of which is Da Bac, 1,129 feet (344m1) high, situated about 2½ miles north-eastward of Le Coin. Bai Doc (Byut), a peak, 1,606 feet (489m5) high, lies about 7 miles northward of Da Bac, and Vo Quap, 1,976 feet (602m3) high, lies at the northern end of the table-land, about 1½ miles north-westward of Bai Doc, and about 2 miles inland. The village of Bai Doc stands on the coast about 4½ miles northward of Pointe Pao, which is situated about 4¼ miles north-north-eastward of Ham Ninh village (*Lat. 10° 11′ N., Long. 104° 02′ E.*).

The coast for about 2 miles southward of Pointe Pao is fringed by reefs, and a bank, with depths of less than 6 feet (1m8) over it, extends 2⅔ miles eastward from this stretch of coast. Off Pointe Da-Chong, 6½ miles northward of Pointe Pao, a bank, with depths of less than 6 feet (1m8) over it, extends about 3½ miles east-south-eastward.

The north-eastern side of Phu Quoc from Pointe Da-Chong to Cap Kwala (page 177) is fringed by rocks, both above and below water, extending nearly one mile offshore, and a bank, with depths of less than 5 fathoms (9m1) over it, extends as much as 3 miles offshore. Hon Mot (Low island) lies close offshore, about 4½ miles south-eastward of Cap Kwala. A shoal, which dries 3 feet (0m9), lies nearly 1¼ miles east-north-eastward of Cap Kwala, and a rock, with a depth of less than 6 feet (1m8) over it, lies about three-quarters of a mile offshore, and 1½ miles south-eastward of the same cape. A shoal, with a depth of 2¼ fathoms (4m1) over it, lies about 2½ miles eastward of Cap Kwala.

Anchorages.—Off the eastern side of Phu Quoc, the irregularity of the bottom makes anchorage difficult.

During the South-west monsoon, the most sheltered anchorage is in the bay north-westward of Presqu' île aux Singes; the depths in this bay decrease regularly as the shore is approached and depths of 20 feet (6m1) will be found about 2¾ cables from the head of the bay, where there is a landing place.

Vessels can anchor in Baie de Dam, in a depth of about 3½ fathoms (6m4).

Anchorage may be obtained, in a depth of 2¾ fathoms (5m0), about 3 miles off the village of Ham Ninh. There is a better anchorage in the South-west monsoon, in the same depth, in Baie de Baï Vian, northward of Pointe Da-Chong, about 2¼ cables offshore, but the landing place is bad.

Eastern side of Chenal Sud.—Dangers.—The shoal, on which s.s. *Donai* was reported to have touched bottom, in 1898, lies about 15 miles east-north-eastward of Frère de l'Est (page 177).

Pulau Cici (Sisi), consisting of two islets, the northern of which is 211 feet (64m3) high, covered with trees and connected by a reef, lies on the eastern side of Chenal Sud, about 9¼ miles eastward of Pointe Pao, and at the southern end of a bank, with depths of less than

Charts 2723, 2414, 2660a, 1263.

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Chart 2725.

3 fathoms (5m5) over it, which extends about 21 miles southward from the coast between Pointe Kep and Cap Bumbi.

Roche Rosita, which dries 2 feet (0m6) and is steep-to, lies about 4¾ miles north-north-westward of Pulau Cici, on the same bank. Pnom Sor (Bumbi cone) (page 177), in line with the eastern side of Cap Bumbi, bearing 000°, leads about half a mile westward of Roche Rosita and over 3 miles westward of Pulau Cici, in a depth of not less than 2¾ fathoms (5m0).

Roche du Brandon, which lies on the same bank, has been mentioned on page 176.

Île Rocheuse (Rocky islet), 24 feet (7m3) high, lies on the western edge of the same bank, about 6 miles westward of Pointe Kep. A rock, with a depth of 2 feet (0m6) over it, lies about 4 cables northward of Île Rocheuse, and a shoal, with a depth of 1½ fathoms (2m7) over it, lies about 1¼ miles north-north-eastward of the islet.

Île Temple lies about 1¼ miles east-south-eastward of Île Rocheuse. A rock, with a depth of 2 feet (0m6) over it, lies about 8 cables south-westward of Île Temple, and a rock, awash, lies about 5 cables south-eastward of the islet.

The coast of the mainland between Pointe Kep and Cap Bumbi forms the north-eastern shore of Chenal Sud; between these points there is a shallow bight. A shoal, with a depth of one fathom (1m8) over it, lies midway between Île Temple and Pointe Kep (*Lat. 10° 28′ N., Long. 104° 17′ E.*).

Anchorage.—Directions.—Anchorage may be obtained about 1½ miles southward of Cap Bumbi on the alignment of Pnom Sor and the eastern side of Cap Bumbi, in a depth of 3¾ fathoms (6m9), or westward of Île Rocheuse where the depth is greater.

Vessels may, if necessary, pass between Les Frères and Îles d'An Thoï, but they should round Pointe Ong Doi at a distance of at least 5 miles.

South-western side of Phu Quoc.—Light.—Beacon.—Between Pointe Hant and Pointe Hong Quoy, about 18 miles north-north-westward, there is a slight bight in the south-western side of Phu Quoc, which is clear of off-lying dangers. A square hill, 602 feet (183m5) high, is situated near the coast about 3 miles north-north-westward of Pointe Hant.

Cua Giong (Kua Giang) is marked by a large rock surmounted by a white mast, near which is a pagoda, on the southern side of its entrance, about 10 miles northward of the square hill. The entrance to the river is difficult, but small craft can reach the pier at all times.

Duong Dong, the capital of the island, stands on the southern side of Cua Giong; it is the centre of an important fishing industry. There is a post office here.

There is steamer communication with Hatien, but it is interrupted during the South-west monsoon.

A light is exhibited, at an elevation of 49 feet (14m9), from a white pylon, on the southern side of Cua Giong.

A beacon stands on the edge of the reef extending about three-quarters of a cable north-westward from the light-structure.

Rocks, with a depth of less than 6 feet (1m8) over them, lie close off Pointe Hong Quoy. Hon Mong Tai, a rock above water, lies close southward of the point situated about 1¾ miles west-north-westward of

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Chart 2725.

Pointe Hong Quoy, and a rock, with a depth of 8 feet (2m4) over it, lies about half a mile eastward of Hon Mong Tai. Cap Da Trai lies about 4 miles north-westward of Hon Mong Tai.

Hon Do Moi (Spread Tree island) (*Lat. 10° 19′ N., Long. 103° 49′ E.*), with some rocks close south-westward of it, lies about 2¾ miles southward of Cap Da Trai and about one mile offshore.

Anchorages.—During the North-east monsoon, anchorage can be obtained anywhere off the south-western side of Phu Quoc.

Anchorage may be obtained by vessels with local knowledge off the mouth of Cua Giong, with the large rock surmounted by a white mast, bearing 107°, also in a depth of about 6 fathoms (11m0), about 4½ cables westward of the light-structure.

Sheltered anchorage can be obtained off the mouth of a small river about 2 miles north-north-westward of Pointe Hant, in a depth of 2¾ fathoms (5m0), but in this position the swell is felt.

Chenal Ouest.—Dangers.—Vessels drawing more than 15 feet (4m6) should use Chenal Ouest when approaching Kampot. The depths in the fairway of the channel are not less than 6 fathoms (11m0) until within a radius of about 7 miles from that place. Large vessels cannot proceed more than 5 or 6 miles eastward of Cape Kwala.

Chenal Ouest is entered between Cap Da Trai and the south-eastern extremity of Tian Moi (Water island), about 3 miles north-westward.

Hon Tray Boy (Clump island), 57 feet (17m4) high and covered with trees, lies about 1½ miles westward of Cap Da Trai and a shoal, with a depth of 6 feet (1m8) over it, lies between them, about 4 cables eastward of Hon Tray Boy.

Hon Ran (Channel island) lies in the entrance to the channel, nearly one mile northward of Hon Tray Boy. Pointe Ganh Daee (North-west point), the north-western extremity of Phu Quoc, lies one mile north-north-eastward of Cap Da Trai. Rocher Plat (Flat rock) lies within the entrance, about three-quarters of a mile north-north-westward of Pointe Ganh Daee ; a rock, awash, lies nearly midway between Rocher Plat and the point.

On the north-western side of the entrance, Tian Moi is 710 feet (216m4) high at its north-western end. Phu Du (Middle island) lies about three-quarters of a mile north-westward of Tian Moi and is separated from the mainland, westward and northward, by a shallow channel half a mile wide. The mouth of Rivière Dat-Sap is situated north-westward of the north-western extremity of Phu Du.

Phu Du has two peaks, the northern one being 572 feet (174m4) high. A rock, with a depth of less than 6 feet (1m8) over it, lies about three-quarters of a mile west-north-westward of the western extremity of the island, and a rocky patch, with a depth of 5 feet (1m5) over it, lies about 4 cables southward of the southern extremity of the island, in the western approach to the channel between Phu Du and Tian Moi ; the tidal streams in this channel are very strong and dangerous for small craft.

Île Cone lies about half a mile westward of the southern extremity of Tian Moi and a shoal, with a depth of 4 fathoms (7m3) over it, lies about 1¼ miles south-westward of the same point.

A detached shoal, with a depth of 1½ fathoms (2m7) over it, lies about half a mile south-south-eastward of the southern extremity of Tian Moi.

Charts 2723, 2414, 2660a, 1263.

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Chart 2725.

A rock, with a depth of 2 feet (0m6) over it, lies about half a mile south-south-eastward of the eastern extremity of Tian Moi; and a shoal, with a depth of 5½ fathoms (10m1) over it, lies about 2 miles south-eastward of the same point. Between the southern extremity of Tian Moi and a point on the mainland about 15 miles north-eastward, a bank, with depths of less than 5 fathoms (9m1) over it, extends about 7 miles from the mainland.

Between the mouth of Rivière Dat-Sap and the point referred to above, there is a shallow bight in the mainland, into the head of which Rivière Smait discharges.

On the south-eastern side of Chenal Ouest, there is a bight in the north-western side of Phu Quoc between Pointe Ganh Daee and Cap Kwala (page 177). Pic Kwala, 1,212 feet (369m5) high, lies nearly one mile southward of Cap Kwala, and Faux (False) Kwala, 1,196 feet (364m6) high, lies about 4 miles south-south-westward of the same cape.

A shoal, with a depth of 2 feet (0m6) over it, the position of which is doubtful, lies about 1½ miles west-north-westward of Cap Kwala (*Lat. 10° 27′ N., Long. 103° 59′ E.*). Banc du Loire Infèrieure, with a depth of 1¾ fathoms (3m2) over it, lies about 1¼ miles northward of Cap Kwala.

The north-eastern side of Phu Quoc, and the dangers off-lying it, are described on page 179.

On the northern side of Chenal Ouest, between Cap Bumbi (page 177) and a point about 9 miles westward, the coastal bank, over which there are depths of less than 3 fathoms (5m5), extends from about one to 5 miles offshore. A rock, above water, lies about three-quarters of a mile offshore, 4 miles westward of Cap Bumbi, and a sunken rock lies about three-quarters of a mile farther westward. A patch of sunken rocks lies about half a mile offshore, 7½ miles westward of Cap Bumbi, and another sunken rock lies about three-quarters of a mile farther southward.

Anchorages.—During the North-east monsoon, good anchorage will be found on the north-western side of Tian Moi, about a quarter of a mile offshore, in a depth of 4 fathoms (7m3), avoiding the rock, previously mentioned, which lies southward of Phu Du.

Anchorage off the northern coast of Phu Quoc is not recommended.

The anchorages southward of Cap Bumbi are described on page 180.

Directions.—A vessel approaching Chenal Ouest from westward should pass close northward of Hon Ran and Rocher Plat, thence northward of Cap Kwala at a distance of 2 miles or more in order to avoid the dangers which lie off it and the shoal water which lies off the north-eastern side of Phu Quoc.

The channel eastward of Hon Tray Boy and southward of Rocher Plat is not recommended, as the ground is foul between them and Phu Quoc, and the set of the tidal streams is irregular.

Caution should be used in standing towards the edge of the bank which extends from the northern shore of the channel when approaching Kampot, as it is steep-to and rocky.

Small vessels bound for Kampot, after passing Cap Kwala, and the 2¼-fathom (4m1) shoal eastward of it, should haul south-eastward and keep the cape bearing more than 272° until Pnom Dong bears about 358° or until Pnom Sor is in line with the eastern side of Cap Bumbi,

Charts 2723, 2414, 2660a, 1263.

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Chart 2725.

which mark will lead to the anchorage off Cap Bumbi (*Lat. 10° 32′ N., Long. 104° 10′ E.*).

Tidal streams.—The tidal streams in the vicinity of Kampot, as in most parts of the Gulf of Thailand, run for 12 hours when the moon has a high declination north or south, and are subject to great irregularities.

Winds.—During the months of March and April the winds are usually from south-east with strong squalls from north-west to east-north-east at times. The temperature at that period is about 86°, sometimes reaching 90°. During the remaining months the ordinary North-east and South-west monsoons probably prevail.

Kampot.—The town of Kampot (*see* page 177) owes its importance to the extension of the pepper trade. The neighbourhood is thickly populated. Beef and other supplies may be obtained.

There is a quay near the Residency, about 2½ miles above the Custom house which is situated at the mouth of the river. Landing can be effected at any state of the tide.

There is steamer communication with Hatien. Kampot is connected to the general telegraph system.

There are three channels by which junks can enter the river, that eastward of Cap Bumbi being the best. The bar has a depth of about 2 feet (0^{m}6), but within it the depths increase to 12 feet (3^{m}7) or more. The channel over the bar is marked by stakes, but no vessel should attempt to enter without local knowledge. A boat can cross the bar at all times when the water is smooth, but during the South-west monsoon the sea breaks along the whole coast at times.

Charts 2722, 2723.

COAST.—Between the point on the mainland one mile northward of the western extremity of Phu Du and a point about 6 miles westward, a bank, with depths of less than 5 fathoms (9^{m}1) over it, extends about 2 miles offshore.

Between the last mentioned point and the south-eastern entrance point of Baie de Riem, about 1¾ miles north-westward, there is a slight indentation in the coast from the head of which a bank, with depths of less than 3 fathoms (5^{m}5) over it, extends 1¼ miles southward. Île du Chenal (Channel island) lies on the above bank, about 4 cables offshore.

Baie de Riem.—Dangers.—Lights.—Baie de Riem is entered between the south-eastern entrance point and a point about 3¼ miles north-westward. Four islands lie in the entrance. Île de la Baie (Bay island), the south-easternmost and largest, is 375 feet (114^{m}3) high at its north-western end, and has a Custom house on its north-eastern extremity. Île Sud-ouest (South-west island), 342 feet (104^{m}2) high, lies about one mile westward of Île de la Baie. Île du Milieu, 129 feet (39^{m}3) high, lies about half a mile north-north-eastward of Île Sud-ouest. Île Nord-ouest (North-west island), 195 feet (59^{m}4) high, lies about one mile south-westward of the north-western entrance point of the bay. Reefs fringe all the islands.

Île Ronde (Round island) lies in the north-western approach to Baie de Riem, about 1½ miles northward of Île Nord-ouest, and 8½ cables offshore.

A bank, with depths of less than 3 fathoms (5^{m}5) over it, extends

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Charts 2722, 2723.

about 2 miles from the head of the bay. There are several villages along the shore, which is inundated at times.

There is a concrete jetty, about 150 feet (45m7) long, with a depth of about 24 feet (7m3) at its head, where vessels not exceeding 200 feet (61m0) in length can lie alongside, situated about half a cable northward of the south-eastern entrance point of the bay.

There is a least depth of 3 fathoms (5m5) in the fairway between the north-western end of Île de la Baie and Île du Milieu, but there is a spit, with a depth of 2½ fathoms (4m6) at its outer end, extending about 2¾ cables south-eastward from Île du Milieu.

Two shoals, with depths of 7 and 8 feet (2m1 and 2m4) over them, lie about half a mile north-north-eastward of the Custom house on Île de la Baie.

Rocher Blanc lies on a ledge of rocks extending 4½ cables southward from the north-western entrance point of the bay.

Leading lights are situated on the south-eastern entrance point of Baie de Riem. The front light (*Lat. 10° 30′ N., Long. 103° 36′ E.*) is exhibited, at an elevation of 33 feet (10m1), from a white framework pylon, about 34 feet (10m4) in height, situated about 6 cables east-south-eastward of the Custom house on Île de la Baie; the rear light is exhibited, at an elevation of 43 feet (13m1) from a similar structure, about 39 feet (11m9) in height, 317 yards (289m9) north-north-westward of the front light. These lights in line, bearing 348°, lead to the entrance of the passage between Île du Chenal and the eastern side of Île de la Baie.

Two lights are exhibited, at an elevation of 20 feet (6m1), each from a red pylon, on a jetty northward of the main jetty.

Rivière de Riem discharges into the north-western part of the bay and a village of the same name is situated about 2½ miles north-eastward of its mouth; the village is connected to the general telegraph system. The river has a least depth of 2 feet (0m6) for a distance of about 2 miles up, above which it nearly dries.

Anchorage.—Directions.—Baie de Riem, though exposed to the South-west monsoon, affords fairly secure anchorage, during that period, off the north-eastern extremity of Île de la Baie.

Vessels drawing less than 15 feet (4m6) can enter by any passage, except that between Île du Chenal and the mainland.

The best anchorage is at the northern end of the channel between Île du Chenal and Île de la Baie, with the northern side of the pier bearing 105°, in a depth of about 6 fathoms (11m0).

If proceeding farther into the bay by this channel the two shoals north-north-eastward of the Custom house, previously mentioned, should be avoided by passing south-westward of them.

Tidal streams.—The flow begins to set northward about half an hour before low water at Hatien, and southward in the part of the bay north of the jetty and south-eastward in the bay south of the jetty, about 4 hours after high water at Hatien; the rate attains about 2 knots. The flow is felt at the jetty.

Chart 2722.

Outlying islands and dangers.—Pulau Wai, the south-western-most of these islands, lies 51 miles south-westward of Île de la Baie. *Chart 2101, plan of Pulo Wai.*

Pulau Wai consists of two wooded islands; the western island is

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Chart 2101, plan of Pulo Wai.

300 feet (91m4) high at its south-eastern end and rocks extend a short distance from its northern and north-eastern extremities. There is a sandy bay on its north-eastern side.

The eastern island, 200 feet (61m0) high at its northern end, is separated from the other by a channel about three-quarters of a mile wide, with depths of over 10 fathoms (18m3) in the fairway. A reef extends a short distance from the northern end of the eastern island, and another reef extends about 4 cables from its eastern end. A rock, 3 feet (0m9) high, with rocks, with a depth of less than 6 feet (1m8) over them, close eastward and westward of it, lies about three-quarters of a mile eastward of this island and there is a patch, with a depth of 4½ fathoms (8m2) over it, about 2 miles southward of the 3-foot (0m9) high rock. Roche Saracen, awash, lies about three-quarters of a mile northward of the eastern island.

Chart 2722.

Le récif Depond, awash and steep-to, lies about 12 miles east-north-eastward of Pulau Wai. In fine weather this reef is difficult to distinguish.

Ko Tang (*Lat. 10° 18′ N., Long. 103° 06′ E.*), 440 feet (134m1) high at its northern end, wooded and inhabited, lies about 23 miles north-north-eastward of Pulau Wai. It is reported to lie one mile farther eastward than charted. There is a sandy bay on its eastern side, with Îlot Abri (Shelter islet) lying about 6 cables northward of its southern entrance point.

An islet lies about one mile south-eastward of Ko Tang.

Îlots du Sud-est (South-east islets), two in number, about 4 cables apart, with a depth of 15 fathoms (27m4) between, lie about 4¾ miles east-south-eastward of Ko Tang. The north-western islet is 141 feet (43m0) high and the other 106 feet (32m3) high. Two detached shoals, the northern one, with a depth of 3¾ fathoms (6m9) over it, and the other with a depth of 4¾ fathoms (8m7) over it, lie, respectively, about 6½ and 11½ cables south-south-eastward of the south-eastern islet.

Îlot Veer, 120 feet (36m6) high and steep-to, lies about 15 miles west-south-westward of Ko Tang.

Ko Prins, 200 feet (61m0) high, with a rock, awash, close westward of it, lies about 9½ miles west-north-westward of Ko Tang; an islet, 150 feet (45m7) high, lies about 6 cables west-south-westward of Ko Prins, and another islet, 20 feet (6m1) high, about 6 cables farther west-south-westward.

Chart 2101, plan of Pulo Wai.

Anchorages.—Good anchorage will be found off the northern side of the eastern island of Pulau Wai, but the best berth is off the sandy bay on the north-eastern side of the western island, about a quarter of a mile offshore, in a depth of 8 fathoms (14m6).

Chart 2722.

The sandy bay on the eastern side of Ko Tang affords good anchorage during the South-west monsoon.

Baie de Kompong Som.—Islands and dangers in approach.—Baie de Kompong Som is entered between a point on the mainland situated about 5 miles north-westward of Île Ronde (page 183), and Pointe Samit, 490 feet (149m3) high, about 26 miles farther north-westward and extends about 32 miles northward from the former point. Several islands and dangers lie in the approach to the bay.

Charts 2414, 2660a, 1263.

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Chart 2722.

Ko Rong Sam Lem, the south-westernmost of these islands, 690 feet (210m3) high at its northern end and thickly wooded, lies 9½ miles westward of the south-eastern entrance point of Baie de Kompong Som. The south-western and south-eastern sides of the island are steep-to; Îlot Cône, 513 feet (156m4) high, lies in the entrance of a small bay on its northern side, about 3½ cables offshore. A reef extends a short distance from the western entrance point of the bay. A shoal, with a depth of 4½ fathoms (8m2) over it, lies about 1¼ miles eastward of the northern end of Ko Rong Sam Lem. A shoal, with a depth of 3½ fathoms (6m4) over it, lies about half a mile east-south-eastward of the south-eastern extremity of the island.

Chart 2101, plan of Saracen bay.

The eastern side of Ko Rong Sam Lem is indented by Baie du Saracen, which is about a mile wide between the entrance points, and divided, at its head, into two parts by a promontory. Some rocks above water and boulders extend about 2 cables offshore north-westward of the promontory. On the southern side of the bay there is a sandy beach, near the south-eastern end of which is a cascade.

Chart 2722.

Île des Palétuviers (Mangrove island) lies nearly midway between Ko Rong Sam Lem (*Lat. 10° 35′ N., Long. 103° 17′ E.*) and the mainland. A reef extends about 4 cables west-south-westward from the island; a shoal, with a depth of 2¼ fathoms (4m1) over it, lies about 8½ cables northward of the eastern extremity of the island, and a 4½-fathom (8m2) patch lies about 1¼ miles southward of the same point.

Ko Rong, 1,080 feet (329m2) high and wooded, lies about 2¼ miles north-westward of Ko Rong Sam Lem. On its south-western side there is a sandy bay, at the head of which is a stream. The south-western and north-western sides of the island are steep-to. On the northern side of the island there is a bay; a rock, above water, lies about three-quarters of a mile eastward of the western entrance point of this bay, and close offshore. A bank, on the outer end of which is a depth of 2¾ fathoms (5m0), extends about 3½ miles north-eastward from the north-eastern point of Ko Rong, and on the south-eastern side of the bank is Banc de Ko Rong, with a least depth of 1½ fathoms (2m7) over it. The north-eastern side of Ko Rong is indented by two bays. Two islets, named Les Frères, lie about three-quarters of a mile south-south-eastward of the north-eastern extremity of the island.

A bank, with a depth of 3½ fathoms (6m4) at its outer end, extends about 2¾ miles from the south-eastern side of Ko Rong. Îlot Sud lies on this bank about 2 miles north-eastward of the southern extremity of Ko Rong and about half a mile offshore.

Île du Chenal, the northern side of which is fringed with coral, lies about 1¾ miles northward of the north-western extremity of Ko Rong.

Île du Milieu (Middle island) lies about three-quarters of a mile north-north-westward of Île du Chenal, with a channel about half a mile wide between them. A bank, with a least depth of 1¾ fathoms (3m2) over it, extends about 1½ miles east-north-eastward from Île du Milieu. Îlot Nord lies about 4 cables north-eastward of the north-western extremity of Île du Milieu, with shallow patches between. A shoal, with a depth of 3¼ fathoms (5m9) over it, lies about one mile east-north-eastward of Îlot Nord.

Charts 2414, 2660a, 1263.

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Chart 2722.

Îlot Plate lies about one mile north-westward of Îlot Nord ; a rock, with a depth of less than 6 feet (1m8) over it, lies about half a mile eastward of Îlot Plate, but there is a narrow channel between it and Îlot Nord. There is foul ground between the rock eastward of Îlot Plate and the point north-eastward of it.

Southern and eastern sides of Baie de Kompong Som.—Dangers.—Île Coudée (Elbow island) lies close off the south-eastern entrance point of Baie de Kompong Som. A bank, with a depth of 4½ fathoms (8m2) near its outer end, extends about three-quarters of a mile south-westward from the island. Rocher Carré (Square rock), above water, lies about one mile west-north-westward of Île Coudée (*Lat. 10° 38′ N., Long. 103° 29′ E.*), with a least depth of 4 fathoms (7m3) between.

Between the south-eastern entrance point of Baie de Kompong Som and Pointe du Départ, about 6½ miles north-eastward, the coast is fringed by a bank, with depths of less than 5 fathoms (9m1) over it, extending as much as 1½ miles offshore. This stretch of coast is hilly, rising to an elevation of 507 feet (154m5) about 2 miles east-north-eastward of the entrance point of the bay. About 3½ miles eastward of Pointe du Départ and one mile inland there is a prominent tree.

Rocher Eiffel, above water, lies about one mile northward of the eastern extremity of Île Coudée, and about 8 cables offshore. Rocher Touffu, which is prominent, lies about 2½ miles north-eastward of Île Coudée and about 6 cables offshore. A rock, with a depth of 5 feet (1m5) over it, lies about 4 cables northward of Rocher Touffu, and a 2½-fathom (4m6) patch lies about three-quarters of a mile north-north-westward of the same rock.

Île du Départ lies on the coastal bank about one mile north-north-eastward of Pointe du Départ ; a rock, with a depth of less than 6 feet (1m8) over it, lies about a quarter of a mile south-westward of the island. Banc de la Comète, parts of which dry, extends about 5 miles westward from the eastern shore of the bay, about 12½ miles east-north-eastward of Pointe du Départ. Rocher de la Comète, awash, lies on the outer edge of the bank, and Rocher Blanc, above water, lies on the northern edge about 6 cables offshore.

Pointe des Serpents lies 7½ miles northward of Rocher Blanc.

Northern and western sides of Baie de Kompong Som.—Dangers.—The northern shore of the bay is low and bordered with mangroves. Between a point 4 miles eastward of Pointe Samit and a point about 10 miles farther eastward there is a bank, with depths of less than 5 fathoms (9m1) over it, extending about 4 miles from its head. Banc du Milieu, on which there are several rocks above and below water, lies in the middle of this bay, about 3½ miles offshore. Îlot de la Comète lies close south-eastward of the eastern entrance point of this bay. There are numerous fishing stakes eastward of this point.

Cheko, 1¾ miles north-eastward of Îlot de la Comète, is a fishing village built on piles. Pointe Kedith lies about 2¾ miles east-north-eastward of Cheko. From here the coast trends northward for about 13 miles to Pointe des Bonzes near the head of the bay. A bank, with depths of less than 3 fathoms (5m5) over it, extends about 7 miles eastward from this side of the bay, and about 11 miles southward from the head. A 3-fathom (5m5) patch lies about 10 miles eastward of

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Chart 2722.

Pointe Kedith. About 7½ miles eastward of Pointe des Bonzes is Pointe du Chef, the northern entrance point of Rivière de Sre Umbell, which discharges into the north-eastern corner of the bay. The town of Sre Umbell stands on the southern bank, about 8 miles from the mouth, and the town of Kompong Som, which has considerable trade, is situated about 30 miles up river.

Chart 2101, plan of Saracen bay.

Anchorages.—Directions.—During the South-west monsoon there is good anchorage 3 cables off the cascade in the southern portion of Baie du Saracen, in a depth of about 4 fathoms (7m3). In the North-east monsoon the northern portion of the bay affords better shelter.

Chart 2722.

In the South-west monsoon vessels can lie sheltered off the north-eastern side of Ko Rong (*Lat. 10° 43' N., Long. 103° 15' E.*), in depths of from 4 to 8 fathoms (7m3 to 14m6). Anchorage can also be obtained in the sandy bay on the south-western side of the same island; the bay on the northern side of Ko Rong is well protected.

The channel between Ko Rong Sam Lem and Île des Palétuviers can be used approaching from southward. The channel between Ko Rong Sam Lem and Ko Rong can also be used, but it is rocky and unsuitable for anchoring. The channel between Ko Rong and Île du Chenal can be used approaching from westward.

Vessels without local knowledge should not proceed to the head of the bay.

Coast.—An islet lies close north-westward of Pointe Samit, and a 2-fathom (3m7) patch lies close northward of the islet. On the northern side of the point is a small bay where anchorage may be obtained by vessels with local knowledge, in a depth of about 2½ fathoms (4m6). On the shore of the bay are several houses and a wharf.

Between Pointe Samit and a point about 22 miles northward, the land is hilly near the coast, forming rocky bluffs to seaward with sandy bays between, which afford good anchorage with offshore winds.

Coin de Mire (Quoin), with an elevation of 1,146 feet (349m3), is the highest and most remarkable hill on this part of the coast, and is situated about 11 miles northward of Pointe Samit. Pointe de Ko Kussat, one of the bluffs, mentioned above, is 293 feet (89m3) high and rises from a point 12½ miles northward of Pointe Samit.

Off-lying islands and dangers.—Iles Samit are a group of islands lying within 3 miles of the coast extending northward from Pointe Samit. Ko Samit, the southernmost of the group, is 392 feet (119m5) high, and lies about 1¾ miles north-westward of the point. Between this island and the mainland there is a depth of 1½ fathoms (2m7) in the fairway, and less on either side. Several high islets lie within 1½ miles north-westward of Ko Samit. Two islets, connected by a shallow ridge, lie about 1¼ miles northward of Ko Samit, with depths of from 1¼ to 2¾ fathoms (2m3 to 5m0) in the channel between. An islet, 490 feet (149m4) high, lies 3 miles north-north-westward of Ko Samit, and another islet lies nearly one mile farther north-eastward and 1¾ miles offshore. A shoal, with a depth of 7 fathoms (12m8) over it, lies three-quarters of a mile north-westward of the 490-foot (149m4) islet.

Ile de la Table (Table rock), 195 feet (59m4) high, lies about 6 miles

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Chart 2722.

northward of Ko Samit and about 3½ miles offshore. A spit, with a depth of 4 fathoms (7m3) at its outer end, extends about half a mile south-south-westward from the islet. Roche du Branlebas, awash, lies about 2¼ miles north-eastward of Ile de la Table.

Ko Kussat consists of three islets lying within 1¾ miles of the coast and about 3½ miles north-north-eastward of Ile de la Table; the westernmost islet is 293 feet (89m3) high. The south-easternmost islet lies about 3 cables offshore, with a rock, with a depth of less than 6 feet (1m8) over it, close off its south-eastern extremity. A rock, with a depth of 5¼ fathoms (9m6) over it, lies about 2 miles westward of Pointe de Ko Kussat (*Lat. 11° 05′ N., Long. 103° 05′ E.*), and about 1¾ miles northward of the same point and about one mile offshore is an islet with a rock above water about a quarter of a mile south-westward of it.

Outlying dangers.—Récif Condor, which dries one foot (0m3), on which a vessel of that name was lost in 1860, lies about 17½ miles west-south-westward of Pointe Samit. A bank, with a depth of 11 fathoms (20m1) over it, lies about 2 miles south-westward of Récif Condor.

A reef was reported, in 1860, to exist in the vicinity of a position about 24 miles west-south-westward of Pointe Samit; it is not indicated on the chart.

Rocher Kusrovie, 36 feet (11m0) high, lies about 24 miles north-westward of Pointe Samit. The sides of the rock are shelving, and isolated, and isolated rocks extend about half a cable from it.

Banc Ubon Boratit, composed of coral and sand, with a least depth of 4 feet (1m2) over it, lies nearly one mile northward of Rocher Kusrovie; another shoal, with a depth of 3¼ fathoms (5m9) over it, lies about half a mile south-westward of Banc Ubon Boratit. There is deep water between these two shoals and Rocher Kusrovie.

Banc de Vai Sen, with a depth of 6½ fathoms (11m9) over it, lies about 9½ miles north-eastward of Rocher Kusrovie.

Banc de Ko Kong, with a depth of 7 fathoms (12m8) over it, lies about 13½ miles northward of Rocher Kusrovie.

Ko Kong.—Ko Kong, about 23 miles north-north-westward of Pointe Samit, is table-topped, and 1,497 feet (456m3) high at its northern end; it has some sandy beaches along its western shore, which is fairly steep-to, but there are no sheltered anchorages. It is visited occasionally by fishermen.

The south-eastern side of Ko Kong is separated from the mainland by a channel, about 1¾ miles wide, which leads into Baie de Ko Kong. The fairway of this channel lies close along the south-eastern side of Ko Kong, and the depths in it are reported to be less than those shown on the chart; rocks, over which there is a depth of less than 6 feet (1m8), extends about half a mile westward from the south-eastern entrance point of this channel.

The northern end of Ko Kong is separated from Pointe Lem Dam on the mainland by Passe de Lem Dam, about 2 cables wide, which leads into the northern end of Baie de Ko Kong.

Baie de Ko Kong is shallow and numerous small rivers discharge into it from the mainland, which is low in the southern part of the bay but rises gradually farther northward until it joins the high tableland abreast Ko Kut (page 191).

Charts 2414, 2660a.

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Charts 2722, 2721.

Passe de Lem Dam.—Light.—Passe de Lem Dam is entered from westward between the north-western extremity of Ko Kong and Îlot Cône, about 1½ miles north-eastward. There is a depth of 10 feet (3m0) in the fairway of the channel over the bar at the entrance; the depths are greater between Pointe Lem Dam and Ko Kong, and again become less as Baie de Ko Kong is entered.

Îlot Cône, 122 feet (37m2) high, is joined to the mainland by a stone causeway; at its northern end is a Custom house and pier. A house stands on its south-eastern side, where there is another pier. Landing can be effected at these piers at all states of the tide. Fishing stakes extend for a considerable distance westward of Îlot Cône.

A house stands about 1½ cables westward of the eastern extremity of Pointe Lem Dam and a pier extends from the coast a short distance southward of the house.

A light is exhibited, at an elevation of 62 feet (18m9), from a red metal pylon, about 29 feet (8m8) in height, situated on the north-western side of Îlot Cône (*Lat. 11° 26′ N., Long. 102° 59′ E.*).

Tidal streams.—The tidal streams in Passe de Lem Dam are strong. They appear to reverse their direction through the pass every 12 hours about 8 hours before higher high and lower low waters at Miri; at the end of the dry season the greatest rate observed on the falling tide did not exceed 2 knots.

Anchorages.—Directions.—Vessels can anchor in the middle of Passe de Lem Dam off the house on Pointe Lem Dam in a depth of 5½ fathoms (10m1). During the South-west monsoon the best shelter will be found with the pier on Pointe Lem Dam bearing about 338°, distant about one cable.

In the North-east monsoon vessels can anchor north-westward of the light-structure on Îlot Cône; there are numerous fishing stakes here.

A vessel entering should steer with the head of the pier on Pointe Lem Dam in line with a saddle formed by the mountains inland, bearing 098°. When the house on Îlot Cône bears 000°, she should alter course to about 108° and keep in mid-channel.

Coast.—Light.—Rivière Krassop, with a depth of 5 feet (1m5) over its bar, discharges about 5 miles northward of Îlot Cône, and Rivière de Kaspor (Klong Koh Paw), with a depth of 7 feet (2m1) over its bar, discharges about 3 miles farther north-westward. There is a Custom house at the village of Packlang on the western entrance point of Rivière de Kaspor. Ko Yor (River mound), 385 feet (117m3) high, and prominent, appears as an island lying about 1¾ miles north-north-westward of the western entrance point of Rivière de Kaspor. A bank, with depths of less than 5 fathoms (9m1) over it, extends about 4 miles from the coast between the northern end of Ko Kong and the mouth of Rivière de Kaspor.

Chart 2721.

The approximate boundary between Cambodia and Thailand lies 15 miles northward of Ko Kong.

Khao Hua Meow (Maew), a rocky bluff, 233 feet (71m0) high, lies about 22 miles north-north-westward of Ko Yor. Trat (Tung Yai) bay (page 194) is entered between Khao Hua Meow and Hlaem Son (Lem Nam), about 13 miles north-westward. Between Ko Yor and the head of Trat bay the coast is mostly low and bordered by sandy

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Chart 2721.

beaches through which numerous rivulets discharge. Parallel with the coast, from one to 3 miles inland there is a mountain range rising gradually to an elevation of more than 2,000 feet (609^{m}6), the southern end of which lies about 4 miles northward of Ko Yor; one of its most elevated points is 4,000 feet (1,219^{m}2) high, situated about 12 miles north-north-eastward of Khao Hua Meow.

Off-lying islands and dangers.—Ko Kut lies about 24 miles north-westward of Ko Kong (page 189) and about 16 miles offshore. It is a high, level island, being 1,125 feet (342^{m}9) high at its southern end. Ao Yai is entered on its south-eastern side about 3 miles northward of Hlaem Thian, the southern extremity of the island. Ao Sa-lat (Ow Salat) is entered on the north-eastern side of the island, about 2 miles south-south-eastward of Hlaem Yai Tui (Sisah Kut), the northern extremity (*Lat. 11° 46′ N., Long. 102° 32′ E.*).

Ko Maisi Lek (Rate Yai), 340 feet (103^{m}6) high, lies off the entrance of a bay on the north-western side of Ko Kut, about 3 miles south-south-westward of Hlaem Yai Tui. Good anchorage may be obtained by small craft with local knowledge in this bay.

Ko Mak, which has a rocky headland, 350 feet (106^{m}7) high, at its western extremity, lies north-westward of Ko Kut, with a deep channel, 3¾ miles wide, between them. A coral flat, with depths of less than 5 fathoms (9^{m}1) over it, on which is Ko Kradat (Kahdat), 183 feet (55^{m}8) high, and numerous sunken rocks, extends about 4½ miles north-eastward from Ko Mak; at its north-eastern extremity is Richelieu patch. Lau Yang, an islet, 266 feet (81^{m}1) high, lies about half a mile southward of the western extremity of Ko Mak, and Ko Kham (Kam), 257 feet (78^{m}3) high, lies about 4 cables westward of the northern extremity of the same island.

Ko Rang Yai (Loi), 634 feet (193^{m}2) high, lies about 3 miles west-south-westward of Ko Mak. Several rocks, above water, lie close westward of the northern end of the island, and several rocks, above and below water, extend about 6 cables northward and one mile north-eastward from the same point. An islet, 230 feet (70^{m}1) high, lies about three-quarters of a mile northward of the point. Ko Rang Lek, 487 feet (148^{m}4) high, lies close off the southern extremity of Ko Rang Yai.

Ko Chang.—Ko Chang lies about 7 miles north-north-westward of Ko Mak. In the channel between them (*see* page 192) there are numerous islets and dangers. Ko Chang is separated from the mainland north-eastward of it by Ko Chang channel (page 193). The island has several peaked hills intersected by rocky and precipitous ravines. Khao Salakphet, its summit, a table peak near the middle of the southern end, is 2,437 feet (742^{m}8) high.

Western side of Ko Chang.—Off-lying islets and dangers.— Hin Rarb, 2 feet (0^{m}6) high, lies about 7½ miles north-westward of Hlaem Bang Bau, the south-western extremity of the island, and about 2¼ miles offshore. A rock, with a depth of less than 6 feet (1^{m}8) over it, lies about half a mile eastward of Hin Rarb. Hin Samsau, 6 feet (1^{m}8) high, lies about the same distance south-eastward of Hin Rarb. Ko Yuak (Observatory island), 127 feet (38^{m}7) high, lies about 1½ miles south-eastward of Hin Samsau. Ko Pli, 111 feet (33^{m}8) high, and Ko Man Nauk, 117 feet (35^{m}7) high, lie about 1¼ and 5½ cables, respectively, south-eastward of Ko Yuak.

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Chart 2721.

Ko Suwan, 94 feet (28m7) high, with Ko Rom, 6 feet (1m8) high, about 1½ cables south-eastward of it, lie about 1¼ miles north-eastward of Ko Yuak and about half a mile offshore. Ko Man, connected to the western side of Ko Chang by foul ground, is 117 feet (35m7) high, and lies about 7 cables eastward of Ko Man Nauk.

Outlying danger.—A sunken rock was reported, in 1889, to lie about 23 miles westward of the northern end of Ko Chang.

Southern approaches to Trat bay.—The widest approach to Trat bay is that from southward, between Ko Kut and the mainland eastward, in which there is a least charted depth of 6 fathoms (11m0) in the fairway.

In the fairway of the channel between Ko Kut and Ko Mak (page 191) there are depths of from 9 to 10 fathoms (16m5 to 18m3).

The channel between Ko Mak and Ko Chang is entered from westward between Ko Rang Yai and Hlaem Bang Bau, the south-western extremity of Ko Chang, about 10 miles north-north-westward. Hin Look Bart, one foot (0m3) high, lies about 2 miles west-south-westward of Hlaem Bang Bau. The southern side of Ko Chang is indented. Ao Salakphet, shallow and encumbered by two islets, is entered about 4 miles eastward of Hlaem Bang Bau (*Lat. 11° 58′ N., Long. 102° 18′ E.*).

A bank, on which are three islets and at the extremity of which are some rocks, with depths of less than 6 feet (1m8) over them, extends about one mile from the south-eastern end of Ko Chang.

Ko Khlum (Kra), 790 feet (240m8) high, lies about 3 miles south-eastward of Hlaem Bang Bau. Hin Rarp, 4 feet (1m2) high, lies about 1½ miles westward of the southern end of Ko Khlum, and Hin Rua Tak, which dries, lies about three-quarters of a mile north-westward of the same islet.

Ko Wai (Klum), 416 feet (126m8) high, lies about 2 miles eastward of Ko Khlum. Some islets and rocks, above water, lie midway between Ko Wai and the entrance to Ao Salakphet. Hin Plai Nam, awash, obstructs the fairway of the channel about 2¾ miles southward of Ko Wai.

Ko Bai Ting (Koh Bidang), 406 feet (123m7) high, lies about 1¾ miles eastward of Ko Wai. A rock, 9 feet (2m7) high, lies about 1¼ miles eastward of Ko Bai Ting, and Vesatri bank, with a depth of 5 fathoms (9m1) over it, lies near the fairway of the channel, about 1¼ miles south-south-eastward of the same islet. A 4½-fathom (8m2) patch lies on the southern side of the fairway, about one mile northward of Ko Mak.

The southern side of this channel has been described on page 191.

Ko Chan, 330 feet (100m6) high, lies 1½ miles north-eastward of Ko Bai Ting. Ko Mai Soe Yai (Ile du Pic), 842 feet (256m6) high at its northern end, lies about three-quarters of a mile northward of Ko Chan, with a rock, 58 feet (17m7) high, close off its northern end. Ko Mai Soe Yai is separated from the islets which extend from the south-eastern end of Ko Chang by a channel about 1¼ miles wide, which leads into Ko Chang channel.

Several islets lie within 2 miles east-north-eastward and eastward of Ko Mai Soe Yai. Ko Mai Soe Lek (Le Chameau), 380 feet (115m8) high, and Ko Maw Nai (La Mangue), 150 feet (45m7) high, half a mile northward of it, lie on the same bank about 3 cables eastward of Ko

Chart 2414.

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Chart 2721.

Maisi Soe Yai. Ko Farami Tai, 94 feet (28m7) high, lies half a mile east-north-eastward of Ko Mai Soe Lek, and Ko Maw Nok, 98 feet (29m9) high, lies 2 cables eastward of Ko Farami Tai. Ko Farami Nua (Le Soulier), 71 feet (21m6) high, lies about 7 cables east-north-eastward of Ko Maw Nai. A 3-fathom (5m5) patch lies about 6 cables southward of Ko Maw Nok.

Ko Chang channel.—Dangers.—Lights.—Ko Chang channel is entered from north-westward between the north-western extremity of Ko Chang and Hlaem Sing (Lem Ling), about 3½ miles north-north-eastward. Ko Chang Noi, 117 feet (35m7) high, lies close north-westward of the former point. Rocks, awash, extend about 2½ cables south-westward from Hlaem Sing.

Hin Khi Chang (La Fourmi), 4 feet (1m2) high, lies on the northern side of the fairway, about 3 miles south-eastward of Hlaem Sing.

A light is exhibited, at an elevation of 29 feet (8m8), from a white iron framework structure, 26 feet (7m9) in height, on Hin Khi Chang.

A rock, awash, lies 6½ cables north-eastward of Hin Khi Chang. Hlaem Lan Thom lies on the northern side of the channel about 1¾ miles north-eastward of Hin Khi Chang. Between Hlaem Lan Thom and Hlaem Ngaup (ngop), where there is a pier, about 4 miles eastward, there is a shallow bight. Ko Pui lies in the north-western part of this bight about half a mile offshore.

A light is exhibited, at an elevation of 32 feet (9m8), from a white concrete framework structure, 33 feet (10m1) in height, on Hlaem Ngaup (*Lat. 12° 10′ N., Long. 102° 22′ E.*).

Between Hlaem Ngaup and Hlaem Son, about 14 miles south-eastward, there is a bight, at the head of which is Klong Ta Tapao (day tabao); the coastal bank, with depths of less than 3 fathoms (5m5) over it, extends from 1½ to 6½ miles offshore between these points; between the edge of this bank and the south-eastern end of Ko Chang there are depths of from 3½ to 5 fathoms (6m4 to 9m1). Ko Farami Nua lies on the southern edge of the bank extending from Hlaem Son. A spit, with depths of less than 6 feet (1m8) over it, extends about 1¼ miles south-south-westward from Hlaem Son.

A light is exhibited, at an elevation of 61 feet (18m6), on Hlaem Son.

Hin Mun Chang, a group of rocks, which dries 5 feet (1m5), lies about 6 miles south-eastward of Hlaem Ngaup, and about 3 miles offshore.

On the south-western side of Ko Chang channel there are several villages on the coast; at low water access to them is difficult. Ban Nonsi (Koh chang), where there is a Custom house, lies about 4 miles south-south-westward of Hlaem Ngaup. The coastal bank with depths of less than 3 fathoms (5m5) over it, extends about one mile from the north-eastern side of Ko Chang. Ko Salak Dauk (Les Frères), 193 feet (58m8) high, with Ko Sluk close north-westward, lies on the south-western side of the fairway, about 3½ miles south-westward of Hin Mun Chang.

Anchorage.—Directions.—There is anchorage about three-quarters of a mile south-eastward of Hin Khi Chang light-structure, in depths of from 4½ to 5 fathoms (8m2 to 9m1).

Entering from north-westward vessels should steer for Hin Khi Chang light-structure, bearing 101°, passing from one to 2 cables southward of it, and anchor when it comes in line with, or open south-

Chart 2414.

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Chart 2721.

westward of, Hlaem Sing. Vessels drawing more than 15 feet (4m6) proceeding to Trat bay should possess local knowledge.

Trat bay.—The entrance to Trat (Tung yai) bay is described on page 192. Trat (Tung yai) river flows into the head of the bay, which is shallow. The town of Trat stands on the south-western side of the river, about 4 miles north-north-westward of its mouth.

Anchorage.—There is good anchorage in Trat bay, about 4 miles eastward of Hlaem Son, in a depth of about 4 fathoms (7m3).

Coast.—Between Hlaem Sing and a point of the same name, which is the western entrance point of Maenam Chanthaburi, about 20 miles north-westward, the coast is low and fringed with mangroves. A bank, with depths of less than 6 fathoms (11m0) over it, extends about 3 miles offshore, and during the North-east monsoon there are numerous fishing stakes off this part of the coast. A rocky patch, with a depth of less than 6 feet (1m8) over it, lies close offshore about 2 miles northward of the south-eastern Hlaem Sing.

Chart 2721, plan of Ban Yao river and Wain creek.

Ban Yao river and approach.—Dangers.—Light.—Ban Yao river or Maenam Wen (Wain) is entered between a point about half a mile northward of Khao Chik Nai and a point about half a mile farther northward.

Ko Chik (*Lat. 12° 18′ N., Long. 102° 15′ E.*), 266 feet (81m1) high, and cultivated, lies about one mile westward of Khao Chik Nai, with Ko Chik Klang (Lang) about midway between. There is a village on the northern side of Ko Chik.

A light is exhibited, at an elevation of 62 feet (18m9), from a white concrete structure, 23 feet (7m0) in height, from the north-western extremity of Ko Chik.

A rocky patch, with a depth of less than 6 feet (1m8) over it, lies about 9 cables south-south-eastward of Ko Chik light-structure, and a one-fathom (1m8) patch lies about the same distance south-south-westward.

A shoal, with a depth of 11 feet (3m4) over it and about 1¾ cables long in an easterly and westerly direction, lies on the northern side of the entrance about 1½ miles east-north-eastward of Ko Chik light-structure.

The bar extends about 2 miles south-westward from Ko Chik, the depths in the fairway being from 6 to 7 feet (1m8 to 2m1). A shoal, which dries, extends about 4½ cables northward from the southern entrance point, narrowing the navigable channel to a width of about 2 cables; in this part of the river there is a least depth of 2¾ fathoms (5m0) in mid-stream.

About one mile within the entrance the depths are greater and the river is divided into two branches, the northern branch leading to Ban Yao, a town situated about 10 miles up the river. The eastern branch is known as Wain creek, and is shallow. Both branches are between mangrove swamps, but there are rice fields at Ban Yao. There is a boat channel to Maenam Chanthaburi from near Ban Yao.

Chart 2721.

Coast.—Islets and dangers.—Between the mouth of Ban Yao river and Maenam Chanthaburi the coast is fringed by a bank, which partly dries, extending about 2 to 3 cables offshore.

Chart 2414.

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Chart 2721, with plan of Chentabun river.

Ko Proet (Phroet), 210 feet (64m0) high, lies about 9 miles north-westward of Ko Chik; it is connected to the coast by a ridge, which dries. Ko Kwang, 161 feet (49m1) high, lies about half a mile south-eastward of Ko Proet. Hin Phin, with a depth of 2¼ fathoms (4m1) over it, lies about 9 cables south-south-eastward of Ko Kwang. Ko Nang Ram (Rau), 145 feet (44m2) high, lies about 4 cables offshore, 8 cables north-westward of Ko Proet.

Chart 2721.

Off-lying dangers.—Hin Phut (Alabaster rocks), two in number, one of which dries 3 feet (0m9), lies 7½ miles southward of Hlaem Sing, the western entrance point of Maenam Chanthaburi.

Bojesen rocks, two in number, 4½ cables apart, each with a depth of 6 feet (1m8) over it, lie about 4 miles south-westward of Ko Proet.

Chart 2721, plan of Chentabun river.

Maenam Chanthaburi.—Dangers.—Light.—The entrance to Maenam Chanthaburi (Chentabun river) can be identified by Khao Srabap, 3,058 feet (932m1) high, situated 10 miles north-eastward of Hlaem Sing, and also by Ko Nom Sao (Cone island), 351 feet (107m0) high, about 2 miles westward of Hlaem Sing. Khao Ploi Wan, a hill, about 492 feet (150m0) high, on the summit of which is a pagoda, lies about 10½ miles north-westward of Khao Srabap.

A light is exhibited, at an elevation of 285 feet (86m9), from a white iron pile beacon, 20 feet (6m1) in height, on Hlaem Sing (*Lat. 12° 28′ N., Long. 102° 04′ E.*).

A rock, with a depth of 31 feet (9m4) over it, lies about 1½ miles south-south-eastward of Ko Nom Sao.

Ko Chula lies outside the entrance, about 4 cables south-eastward of Hlaem Sing. Two rocks, each with a depth of 6 feet (1m8) over it, lie about half a cable and 1¾ cables, respectively, northward of Ko Chula. Hin Sukhrip, with a depth of 11 feet (3m4) over it, lies about half a mile south-westward of Ko Chula. A rock, awash, and a rock, with a depth of 10 feet (3m0) over it, lie about 1¼ cables southward of Ko Chula.

Maenam Chanthaburi is entered between Hlaem Sing and Paknam point, about three-quarters of a mile northward. For the coastal bank south-eastward of Paknam point (*see* page 194). Ban Paknam is situated close northward of Paknam point. A rocky bank extends about one cable eastward from Hlaem Sing, leaving a channel 2 cables wide, with a depth of 2 fathoms (3m7) in the fairway. A rock, with a depth of less than 6 feet (1m8) over it, lies about 6½ cables northward of Hlaem Sing light-structure, and close offshore.

The harbour at the entrance to the river can accommodate a few vessels not exceeding 150 feet (45m7) in length, or 8 feet (2m4) draught. There is a concrete pier with a T-head, which is 60 feet (18m3) long, with a depth of 12 feet (3m7) alongside.

Vessels drawing 12 feet (3m7) can proceed up the river for a distance of about 2¼ miles northward of Paknam point, where Ban Lem Pradoh, in which is a Custom house, a church and also a pier, is situated on the western side of the river. It is necessary to moor in the river as the streams are strong.

Tachalep, about 3¼ miles northward of Paknam point, on the north bank of the river, is accessible to vessels of 9 feet (2m7) draught. There is a concrete jetty with a T-head, about 80 feet (24m4) long,

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Chart 2721, plan of Chentabun river.

with a depth of about 20 feet (6m1) at its head, alongside which vessels can berth.

Tachalep is connected with Chanthaburi by a good road, and with Bangkok by steamer.

Chanthaburi.—Chanthaburi, an important town, with a cathedral, stands about 10 miles north-north-eastward of the mouth of the river; boats with local knowledge and drawing about 4 feet (1m2) can ascend the river as far as this town. The town is connected to the general telegraph system.

Pepper, cotton, coffee, and rubber are grown in the district; rice, paper, cloth, charcoal, rubber and mats are the principal exports. Chanthaburi has a considerable trade in precious stones.

Anchorages.—Directions.—A convenient anchorage for small craft may be obtained outside the bar, with Ko Chula bearing 058°, distant one mile, in a depth of 4 fathoms (7m3).

There is anchorage for men-of-war about 4¼ cables northward of Paknam point and local steamers anchor off Ban Lem Pradoh.

Vessels with a draught not exceeding 9 feet (2m7) can approach Tachalep at any state of the tide. There is a shoal, with a depth of 10 feet (3m0) over it, about one mile southward of the pier at Tachalep.

Tidal streams.—The flow in the river is strong and very variable and runs for 12 hours without turning when the moon has a high declination north or south. The out-going stream tends to set a vessel towards Ko Chula.

Coast.—Dangers.—Light.—The coast from Hlaem Sing (*Lat. 12° 28′ N., Long. 102° 04′ E.*) to Hlaem Muh Noi, 312 feet (95m1) high, about 1¼ miles north-westward, is hilly. Hlaem Gating, 324 feet (98m8) high, projects from the coast nearly midway between the two last mentioned points.

Ao Muh Noi is entered between Hlaem Muh Noi and Hlaem Muh Yai, 168 feet (51m2) high, about 4 cables north-westward. The inner part of this bay is encumbered with a drying bank; sunken rocks, some of which are awash, obstruct the entrance.

Hin Kon Au, a group of rocks, one of which dries 4 feet (1m2), lies about 4 cables northward of Hlaem Muh Yai.

Chart 2721.

Ao Muh Yai (Aw Muh) is entered between Hlaem Muh Yai and Hlaem Tai Ran Dok Moi, about 5½ miles west-north-westward. Between Hlaem Muh Yai and the mouth of Maenam Ken Noh, close eastward of Hlaem Tai Ran Dok Moi, the coast is low and wooded, and fringed by a bank, which dries, extending about 3 cables offshore. There are numerous fishing stakes off this stretch of coast during the North-east monsoon.

Khao Bau Toei is the southern end of a hilly projection, the summit of which, about 1¾ miles north-north-westward, is 305 feet (93m0) high. Ko Saba lies southward of Khao Bau Toei, and is separated from it by Chong Saba, about one cable wide. Luk Saba, a reef, extends 2 cables southward from Ko Saba.

The entrance of the Maenam Ken Noh is obstructed by a bar, with a depth of 6 feet (1m8) over it, extending between the northern end of Ko Saba and Hin Pluang. Within the bar the channel is very narrow and, on its eastern side, is a sand spit, which can generally be distinctly seen and which partly dries, extending about one mile offshore.

Chart 2414.

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Chart 2721.

Khung Kraben (Kau Kung Kaben), a promontory, 410 feet (125^{m}0) high and joined to the mainland by a narrow isthmus, lies about 5½ miles north-westward of Ko Saba. The coast between is low and wooded, but close inland is Wat Chaung Khiri, 613 feet (186^{m}8) high, about 2 miles south-eastward of Khung Kraben. Ai Lau rocks, some of which are awash, extend nearly one mile offshore from a point about 2 miles north-north-westward of Ko Saba. Lom (Lawm) rock, with a depth of 2 fathoms (3^{m}7) over it, lies about half a mile south-south-eastward of the southern extremity of Khung Kraben and about the same distance offshore. A bank, with depths of less than 6 fathoms (11^{m}0) over it, extends about 1¾ miles off this stretch of coast.

Ao Khung Kraben is entered close northward of Khung Kraben. The entrance is about 3 cables wide and is obstructed by two islets, on one of which is a pagoda. The bay is shallow and its shores are wooded.

Between Khung Kraben and Hlaem Thorapim (Lem Terapin), about 15 miles west-north-westward, there is a bight in which are several off-lying islets and dangers. The coast is hilly for about 4 miles northward of the northern entrance point of Ao Khung Kraben; thence to Hlaem Thorapim it is low and wooded, and fringed by a bank of mud and sand, which dries, and extends as much as 6 cables offshore. The coastal bank, with depths of less than 5 fathoms (9^{m}1) over it, extends about 2½ miles from the north-eastern shore of the bight, and islets and foul ground extend about 8 miles southward from the north-western shore.

Ban Krachae (Gracha) is situated on the coast about 5 miles north-north-westward of Khung Kraben. Phang Rat stands on the western side of the mouth of Maenam Phang Rat (Parat), about 4 miles north-westward of Ban Krachae, and Ban Prasae stands on the eastern side of the mouth of Maenam Prasae (Pa-Sair), about 5 miles westward of Phang Rat (*Lat. 12° 41′ N., Long. 101° 46′ E.*).

A light is exhibited, at an elevation of 49 feet (14^{m}9), from a white iron framework structure, 52 feet (15^{m}8) in height, on the western side of the entrance to Maenam Prasae.

Outlying danger.—Alhambra rocks, situated about 13 miles southward of Hlaem Thorapim, consist of two coral patches, about 2½ cables apart in a north-easterly direction. The south-western rock is awash, and the sea breaks heavily on it in bad weather; the north-eastern rock has a depth of 6 feet (1^{m}8) over it.

Off-lying islets and dangers.—Light.—Ritidej rock, with a depth of 2 fathoms (3^{m}7) over it, is the outermost of the dangers extending from the north-eastern shore of the above-mentioned bight, and lies about 6 miles west-south-westward of Khung Kraben. Ai (Hin) Lawp rock, which dries, lies about three-quarters of a mile north-north-eastward of Ritidej rock.

Visit rock, with a depth of 3 fathoms (5^{m}5) over it, lies about 4½ miles north-westward of Khung Kraben, and about 2½ miles offshore. Hin ai eorp, reported in 1863, is charted about 2½ miles south-south-westward of Visit rock, and a rock, with a depth of 4¼ fathoms (7^{m}8) over it, lies about one mile southward of Visit rock.

Two rocks lie southward of the mouth of Maenam Phang Rat; Volant rock, the outer one, dries 3 feet (0^{m}9), and is situated about 1½ miles

Chart 2414.

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Chart 2721.

southward; Pang Rad (Rard) rock, awash, lies nearly midway between Volant rock and the river mouth.

Ko Man Nauk (Mon), 171 feet (52m1) high, and fringed by sunken rocks, is the outermost of a chain of islets which lie on the foul ground extending from the north-western shore of the bight.

A light is exhibited, at an elevation of 124 feet (37m8), from a white concrete beacon, on Ko Man Nauk.

Loftus rock, composed of coral, with a depth of one foot (0m3) over it, lies about three-quarters of a mile south-eastward of Ko Man Nauk. Hin Yuan consists of rocks above water, surrounded by sunken rocks, and lies about 4 cables northward of Ko Man Nauk.

Ko Man (Mon) Klang, 95 feet (29m0) high, with a rock, which dries 4 feet (1m2), 2 cables southward of its southern end, lies about 1½ miles north-north-westward of Ko Man Nauk. A shoal, with a depth of 2¾ fathoms (5m0) over it, lies about three-quarters of a mile south-eastward of Ko Man Klang.

Ko Man Nai (Mon Ni), 171 feet (52m1) high, lies about half a mile north-north-westward of Ko Man Klang, to which it is joined by a reef. The area between Ko Man Nai and the coast northward and north-westward is foul and not navigable. Several shoals lie north-eastward of Ko Man Nai, the principal of which are, Ngek shoal, with a depth of one fathom (1m8) over it, which lies about 2 miles north-eastward of the islet, and four rocks, with depths of less than 6 feet (1m8) over them, which lie about one mile southward, and 2, 2¾, and 3¾ miles south-south-eastward of the light-structure at the mouth of Maenam Prasae. A rocky patch, with a depth of 2 feet (0m6) over it, lies about 1½ miles north-eastward of Hlaem Thorapim, and about 9 cables offshore.

Coast.—Off-lying islets and dangers.—Between Hlaem Thorapim (*Lat. 12° 38′ N., Long. 102° 38′ E.*) and Hlaem Tong Lang, about 5 miles westward, there is an indentation in the coast, which is low and wooded; the entrance to Klong Lawon (Ravon) is situated nearly midway between these two points. Ko Kee Plar (Kipla), 26 feet (7m9) high, lies about one mile south-westward of Hlaem Thorapim, and about a quarter of a mile offshore.

Ko Thalu (Tulu), 209 feet (63m7) high, lies about 4¼ miles southward of Hlaem Tong Lang. Rocks extend about 2½ cables southward from Ko Thalu. Hin Klang Rong, which dries, lies about one mile northward of Ko Thalu.

Between Hlaem Tong Lang and Hlaem Yar (Ya), a cliffy promontory, about 8½ miles west-south-westward, there is a bight in the coast, the shores of which are mostly low and wooded; in the approach to this bight are several islets and dangers. The entrance to Klong Klaeng, with Ban Klaeng (Kleng) on its western side, is close eastward of Hlaem Ban Klaeng, a prominent bluff, 86 feet (26m2) high, projecting from the coast and situated about 3½ miles westward of Hlaem Tong Lang; Ao Pae is the western part of this bight and lies between Hlaem Ban Klaeng and Hlaem Yar. Ban Pho (Pae) stands on the coast about 3 miles north-north-eastward of Hlaem Yar. Ko Kang kao is the southernmost of a chain of islets and rocks which extends about 3 miles southward from the entrance to Klong Klaeng; the islet lies about 3 miles south-south-eastward of Hlaem Ban Klaeng. Vessels should pass southward of Ko Kang kao.

Chart 2414.

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Chart 2721.

Ko Kut (Koi), 158 feet (48m1) high, lies close northward of Ko Kang kao. Ko Pla Tin, 89 feet (27m1) high, lies about one mile north-north-eastward of Ko Kut, with Ko Krual, 86 feet (26m2) high, and Ko Kham, 109 feet (33m2) high, between them. All these islets are fringed by sunken rocks which extend as much as one cable offshore.

A rock, awash, lies about midway between Ko Pla Tin and the coast.

Hin Kong Yai, awash, lies about 1¾ miles westward of Ko Pla Tin, on the south-eastern edge of a bank, with depths of less than 3 fathoms (5m5) over it, which extends about 3 miles from the northern shore of the bight. A rock, with a depth of 1¼ fathoms (2m3) over it, lies about one mile north-westward of Hin Kong Yai, and, at the southern end of the same bank, there is a patch, with a depth of 6 feet (1m8) over it, which lies about half a mile east-north-eastward of the northern extremity of Ko Samet (Samit), leaving a narrow channel between the bank and the island. Foul ground extends about one mile from the western shore of Ao Pae. A shoal, with a depth of 6 feet (1m8) over it, lies about 1¾ miles northward of the northern extremity of Ko Samet, and Hin Kan nar, with depths of less than 6 feet (1m8) over it, lies about half a mile farther northward and about a quarter of a mile off the northern shore.

Khao Lem Yar, about 2½ cables north-westward of Hlaem Yar (*Lat. 12° 35′ N., Long. 101° 24′ E.*), is 410 feet (125m0) high. Hills, the eastern sides of which are steep, extend about 1¼ miles northward from Khao Lem Yar. Khao Taphao Khwam, 1,785 feet (544m1) high, lies about 5½ miles northward of Hlaem Yar; it is the southernmost peak of a range of mountains extending about 10 miles northward; the highest and northernmost peak of this range has an elevation of 2,297 feet (700m1). Khao Sarb (Sab), an isolated hill, lies on the coast about 2½ miles north-westward of Hlaem Yar.

Ko Samet.—Dangers.—The northern extremity of Ko Samet lies about 2 miles eastward of Hlaem Yar. The island is very hilly, attaining an elevation of 407 feet (124m0) at its northern end; its coast is cliffy in places especially on its western side, and the eastern side of its southern end. It is almost completely surrounded by rocks, with depths of less than 6 feet (1m8) over them, lying close offshore.

Hlaem Yai, the eastern extremity of the island, lies about 1½ miles south-eastward of the northern extremity; it has two small hills over it, the southern one of which is 63 feet (19m2) high, separated from the hills farther in by low wooded land. Hin Kan-nar, awash, lies about 3 cables south-westward of Hlaem Yai. Hin Khao (White rock), 20 feet (6m1) high, lies about one mile north-eastward of the southern extremity of Ko Samet and about half a mile offshore. Ko Chan, 66 feet (20m1) high and nearly divided into two parts by a low isthmus, lies about 3½ cables southward of Ko Samet; there is a least depth of 9 fathoms (16m5) between them. Hin San Chalam, 2 feet (0m6) high, lies about 4 cables southward of Ko Chan; rocks, awash, extend about 2 cables south-eastward from Hin San Chalam, and there is a rock, above water, about 1½ cables eastward of it.

Chong Samet.—Dangers.—Buoys.—Light.—Chong Samet separates Ko Samet from the mainland. There is a depth of about 3¼ fathoms (5m9) in the fairway of the channel but the channel itself and the approaches to it, either from north-eastward or westward, are encumbered by rocks. The channel should not be used without local knowledge.

Chart 2414.

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Chart 2721.

A light is exhibited, at an elevation of 256 feet (78m0), from a white iron framework structure, 49 feet (14m9) in height, on Hlaem Phra, the north-western extremity of Ko Samet.

A rock, with a depth of 3¼ fathoms (5m9) over it, lies in the north-eastern approach, about 1¾ miles north-eastward of Hlaem Yar, a short distance south-eastward of the foul ground extending from the western shore of Ao Pae, previously mentioned. A shoal, with a depth of 2¾ fathoms (5m0) over it, lies nearly in mid-channel, about one mile eastward of Hlaem Yar.

Anchorage may be obtained, in a depth of about 4¼ fathoms (7m8), about half a mile north-eastward of the light-structure on Ko Samet.

Hin Sunton, with a depth of 1¾ fathoms (3m2) over it, lies in mid-channel about 6½ cables south-eastward of Hlaem Yar, and is covered by the *green* sector of Ko Samet light between the bearings of 078° and 083°.

In the approach to Chong Samet from westward there are two dangers; Bush rock, which dries, is situated about 2½ miles westward of Hlaem Yar (*Lat. 12° 35′ N., Long. 101° 25′ E.*) and about 2 miles offshore, and is covered by a *red* sector of Ko Samet light between the bearings of 086° and 090°; and Redang rock, with a depth of less than 6 feet (1m8) over it, situated about 1½ miles north-north-westward of Bush rock, and covered by a *red* sector of Ko Samet light between the bearings of 099° and 102°. These rocks lie on the outer edge of the coastal bank, with depths of less than 6 fathoms (11m0) over it, which extends nearly 2 miles offshore.

A can buoy, painted in black and white bands, surmounted by a ball, marks the southern side of Bush rock, and a white spherical buoy, with a topmark, marks the northern side of Redang rock.

Outlying shoal.—Victory shoal, composed of coral, was reported by a vessel of that name, in 1879, as being situated about 16 miles south-south-westward of Ko Samet.

Coast.—Dangers.—Light.—Dam rock, with a depth of one fathom (1m8) over it, lies about 4 miles north-westward of Hlaem Yar and about half a mile offshore. A rock, with a depth of 2½ fathoms (4m6) over it, lies about 5¾ miles north-westward of Hlaem Yar and about half a mile offshore.

A bay with a sandy beach is entered between Hlaem Yar and Hlaem Sam San (Sa-Mae-Sarn), sometimes called Cape Liant, about 27 miles westward. The coast is low and wooded, except for Khao Sarb (page 199). Ko Saget (Sakait), 72 feet (21m9) high, with sunken rocks around it, lies nearly midway between the entrance points of the bay on the outer edge of a bank, with depths of less than 3 fathoms (5m5) over it, which extends about 2 miles offshore. Ko Saget is covered by the *red* sector of the light near Rayong, between the bearings of 077° and 087°.

Rayong river discharges into the bay about 6 miles east-north-eastward of Ko Saget; the mouth of the river is continually shifting and its bar nearly dries. The town of Rayong stands on the northern bank of the river about one mile inland; its principal products are pepper and gamboge.

A light is exhibited, at an elevation of 56 feet (17m1), from a white iron framework structure, 51 feet (15m5) in height, about one mile eastward of the mouth of Rayong river.

Chart 2414.

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Chart 2721.

Anchorage may be obtained, in depths of from 4¼ to 7 fathoms (7m8 to 12m8), southward of the light-structure eastward of Rayong river, but there is no shelter in either monsoon. When there is a heavy sea, vessels discharge their cargo at Ko Samet.

Hin Khong, rocks above water, extend about 1¼ miles from a point situated about 10 miles westward of the light-structure eastward of Rayong river. Sunken rocks lie as much as one mile offshore between 1½ and 6 miles westward of Hin Khong.

Chart 3727, Approaches to Satahib bay.

The eastern side of the promontory, of which Hlaem Sam San is the south-eastern extremity, is fringed by rocks which extend a short distance offshore. Hlaem Sam San is 157 feet (47m8) high, and is the eastern entrance point of the bight which forms the head of the Gulf of Thailand. Khao Nong Pakbung, 520 feet (158m3) high, lies one mile northward of the point.

Islands and dangers.—Lights.—Hin Chular, about 2 feet (0m6) high, lies at the extremity of some foul ground which extends 1¾ cables eastward from Hlaem Sam San.

A light is exhibited, at an elevation of 25 feet (7m6), from a white concrete tower with black bands, 20 feet (6m1) in height, on Hin Chular.

Ko Ai Raet (Raed), 330 feet (100m6) high, is separated from Hlaem Sam San by Chaung Sam San (Chong Sa-Mae-Sarn), about a quarter of a mile wide, with a depth of 20 feet (6m1) in the fairway. During spring tides the tidal streams run with considerable velocity through Chaung Sam San, and no vessel without local knowledge should pass through it.

A light is exhibited, at an elevation of 20 feet (6m1), from a white iron framework structure, 16 feet (4m9) in height, on the northern side of Ko Ai Raet (*Lat. 12° 35′ N., Long. 100° 58′ E.*).

Ko Sam San (Sa-Mae-Sarn), 560 feet (170m7) high, lies about 3 cables south-westward of Ko Ai Raet, separated from it by Chong Plawai, in the fairway of which there is a least charted depth of 21 feet (6m4). The eastern side of Ko Sam San is fringed with rocks. A bank, with a depth of 18 feet (5m5) and less over it, extends 9 cables north-westward from the northern extremity of Ko Sam San. A patch of sand, with a depth of 6 feet (1m8) over it, lies about 1½ cables northward of the same point. Ko Pramuk lies 1½ cables south-westward of the northern extremity of Ko Sam San, and is almost joined to it by a reef.

Ko Kham (Kharm), 185 feet (56m4) high, lies about half a mile westward of Ko Sam San. A bank, with depths of less than 6 fathoms (11m0) over it, extends about 2 miles north-westward from Ko Kham, and Hin Lookyoan, awash, lies close off its western extremity. Hin Luk-kunchae, 9 feet (2m7) high, lies 8 cables south-south-eastward of Ko Kham, and half a mile from the western side of Ko Sam San; a rock, awash, lies about 1½ cables north-eastward of Hin Luk-kunchae. Ko Chang Klua (Charngklua), 118 feet (36m0) high, lies about one mile eastward of the southern extremity of Ko Sam San.

Ko Chuang, about 390 feet (118m9) high, lies about 1¼ miles southward of Ko Sam San. Ko Roang-nang and Ko Rong Khon (Roang-khoan) lie close together about a quarter of a mile north-eastward of the northern extremity of Ko Chuang. Hin Lukbed, 22 feet (6m7) high, lies about one mile north-westward of the north-western extrem-

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Chart 3727, Approaches to Satahib bay.

ity of Ko Chuang. Ko Chan, 245 feet (74^{m}7) high, lies 4½ cables eastward of the same island.

A light is exhibited, at an elevation of 438 feet (133^{m}5), from a white masonry tower, 48 feet (14^{m}6) in height, near the summit of Ko Chuang. An additional light is exhibited, at an elevation of 425 feet (129^{m}5), from the same tower.

Hin Chalarm, 27 feet (8^{m}2) high, white and steep-to, lies 2½ miles southward of Ko Chuang; it is covered by a *red* ray from Ko Chuang light.

Chart 2720.

Hin Yai, a 6-fathom (11^{m}0) coral patch, lies about 2¼ miles south-south-westward of Hin Chalarm.

Tidal streams.—Along the eastern shore of the Gulf of Thailand, northward of Hlaem Sam San, the flow sets northward when the tide is rising at Bangkok bar and southward when it is falling there. About one mile northward of Hlaem Som Muk (page 207) the flow is north-easterly towards the mouth of Maenam Bang Pakong (page 210) on the rising tide.

Chart 3727, plan of Approaches to Satahib bay.

Coast.—Between Hlaem Sam San and Hlaem Tonglarng, 199 feet (60^{m}7) high, about 3¼ miles west-north-westward, there are two bights, the shores of which are low and wooded, but the points rise steeply to hills, from about 200 to 300 feet (61^{m}6 to 91^{m}4) high. Khao Kataquam, 452 feet (137^{m}8) high and cone-shaped, rises steeply from the coast, about half a mile south-eastward of Hlaem Tonglarng.

Ko Chaurakhe (Chora-khay), 182 feet (55^{m}5) high, lies about one mile southward of Hlaem Tonglarng and about 4½ cables offshore. Rocks, which dry, and rocks, awash, fringe the islet, and a bank, with depths of less than 3 fathoms (5^{m}5) over it, extends about 3 cables northward and eastward. Ko Narng-ram lies about 4 cables southward of Hlaem Tonglarng, and is nearly joined to the mainland by drying rocks.

Sattahip bay.—Islands and dangers.—Buoy.—Light.—Sattahip (Satahib) bay is entered between Hlaem Tonglarng (*Lat. 12° 37′ N., Long. 100° 55′ E.*) and Hlaem Pu Chao (Pu-tou), a bluff headland, 497 feet (51^{m}5) high, about 4 miles west-north-westward. Ao Chuksamed, about one mile wide between the entrance points, is situated in the south-eastern part of the bay, close north-eastward of Hlaem Tonglarng. The shore of Ao Chuksamed is low and wooded, and fringed by a drying bank of sand and stones, which extends about 2¼ cables offshore.

A seaplane station, the hangars of which are prominent, with a slip-way and two small piers, is situated on the southern shore of Ao Chuksamed.

Between the north-eastern entrance point of Ao Chuksamed, which is 445 feet (135^{m}6) high, and Hlaem Thian, about 2½ miles north-westward, the shore of Sattahip bay is low and wooded, and fringed by a sandy beach. Ban Sattahip (Satahib), where there is a telegraph office and several jetties, stands at the head of the bay near the western end of the sandy beach. Between Hlaem Thian and Hlaem Pu Chao the coast is mostly hilly and fringed by stony beaches.

The Naval station, from which three piers extend, lies about one

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Chart 3727, plan of Approaches to Satahib bay.

mile westward of Ban Sattahip. Khao Sattahip (Satahib), 894 feet (272m5) high, lies about 1¾ miles north-eastward of Ban Sattahip.

Several islands and dangers lie in the western part of this bay. Ko Tao Mau (Goh Tou maw), 458 feet (139m6) high, is the largest of these islands and lies about three-quarters of a mile south-eastward of Hlaem Pu Chao.

A light is exhibited, at an elevation of 38 feet (11m6), from a white iron pile beacon, 13 feet (4m0) in height, on a rock, situated close off the north-western extremity of Ko Tao Mau.

There is a flagstaff and a small pier on the north-eastern extremity of Ko Tao Mau, and another small pier is situated near the north-western extremity of the island.

A bank, which dries, extends over one cable from the northern and eastern sides of Ko Tao Mau, and a bank, with depths of less than 3 fathoms (5m5) over it, extends about 3 cables from its northern side, leaving a narrow channel between the island and the mainland, with a least depth of 19 feet (5m8) in the fairway. A white can buoy marks the north-eastern edge of the shore bank about 2 cables south-eastward of the north-eastern extremity of Ko Tao Mau.

Ko Phra Yai (Prah), 291 feet (88m7) high, lies about 2½ cables north-eastward of Ko Tao Mau, with depths of from 15 to 33 feet (4m6 to 10m1) in the channel between them; a rock, awash, lies on the edge of the channel about half a cable south-westward of the north-western extremity of Ko Phra Yai. The northern side of the island is fringed by boulders and there are some off-lying rocks awash, the positions of which can best be seen on the chart; a small pier projects from near its north-western extremity, and two other piers are situated westward and eastward, respectively, of the north-eastern extremity of the island.

There is an oil wharf with a T-head, 250 feet (76m2) long, with a depth of 19 feet (5m8) alongside, near the western end on the northern side of Ko Phra Yai. The approach to this wharf from westward is difficult, and a vessel should turn and secure alongside heading west.

A bank, which dries, extends about 2 cables northward from the eastern end of Ko Phra Yai, and there are depths of less than 3 fathoms (5m5) between this bank and the mainland.

Ko Pranoi (*Lat. 12° 39′ N., Long. 100° 54′ E.*), 103 feet (31m4) high, lies 2¾ cables eastward of Ko Phra Yai, with foul ground between. A bank, which dries, extends about 2½ cables northward from Ko Pranoi, and a bank, with depths of less than 3 feet (0m9) over it, extends about 2¼ cables farther northward. A rock, with a depth of 6 feet (1m8) over it, lies in mid-channel about 6½ cables northward of Ko Pranoi.

A bank, with depths of less than 3 fathoms (5m5) over it, extends nearly 1½ miles southward from Ko Pranoi, and at its outer end is Ko Mu, 219 feet (66m7) high. A rock, with a depth of less than 6 feet (1m8) over it, lies half a mile westward of Ko Mu. A shoal, with a depth of 11 feet (3m4) over it, lies one mile north-eastward of the same island.

Ko I Lao (Ea-lou), 203 feet (61m9) high, the outermost of the islets in the approach to the bay, lies 9 cables south-south-eastward of the southern extremity of Ko Tao Mau. The south-western and eastern sides of Ko I Lao are fringed by rocks, and rocks extend about 1½ cables

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Chart 3727, plan of Approaches to Satahib bay.

from its northern end. Ko Yaw, 183 feet (55m8) high, lies north-eastward of Ko I Lao on the same bank, separated from it by a narrow, shallow channel; a bank, with depths of less than 3 fathoms (5m5) over it, extends about 1½ cables northward from it. Ko Meo, 42 feet (12m8) high, lies about 4 cables south-eastward of Ko Yaw; a spit, with rocks above water on its inner end, and a depth of 6 feet (1m8) at its outer end, extends 2¾ cables northward from the islet.

Tidal streams.—Westward of Ko Tao Mau the flow attains a rate of from one to 1½ knots, setting north-west on the rising tide and south-east on the falling. In the channel between Ko Tao Mau and Ko Prah the flow attains a rate of from one to 2½ knots, directions as above. About half a mile southward of Ban Sattahip the flow reaches a quarter to three-quarters of a knot, setting 260° on the rising tide and 080° on the falling.

Between Ko Tao Mau and Ko Yaw the flow sets south-westward at a rate of from half a knot to one knot on the rising tide; north-westward of Ko Mu it sets 255° at a rate of from a quarter to half a knot on the rising tide. In the channel between Ko Chaurakhe and the mainland the flow sets north-west on the rising tide and south-east on the falling, attaining a rate of from one to 1½ knots. About half a mile northward of Hlaem Tonglarng the flow sets north-westward on the rising tide, at a rate of from half a knot to one knot. The directions are reversed on the falling tide.

Anchorages.—There is an outer anchorage about half a mile westward of the northern end of Ko Tao Mau (*Lat. 12° 38′ N., Long. 100° 52′ E.*), in a depth of about 6 fathoms (11m0).

Vessels with local knowledge can anchor northward of the north-eastern extremity of Ko Tao Mau, in depths of from 3½ to 4½ fathoms (6m4 to 8m2), but the channel, previously mentioned, leading to this anchorage from westward is narrow.

The anchorages north-eastward of Ko Tao Mau are reported to be unsafe, especially during the South-west monsoon.

Ko Khram Yai.—Dangers.—Ko Khram Yai (Goh Kram) lies with its southern extremity about 4 miles west-north-westward of Hlaem Pu Chao. Ko Khram Yai is 790 feet (240m8) high near its southern end, and is separated from the mainland by Chong Kram, about 1¾ miles wide. The western side of the island is fringed by a rocky bank with depths of less than 6 feet (1m8) over it, extending as much as 1½ cables offshore, and is fairly steep-to.

Ao Pudsawan, 5½ cables wide between its entrance points, lies on the north-western side of Ko Khram Yai; foul ground, over which there is a strong tidal stream or current, extends about 1½ cables from the western entrance point. The depths in the bay, within a line joining the entrance points, are less than 3 fathoms (5m5). The coast at the head of the bay is low and wooded; a bank which dries extends over one cable from the head.

Small vessels may obtain a temporary anchorage in Ao Pudsawan.

A shoal, with a least depth of 14 feet (4m3) over it, lies about 1¼ miles northward of Ko Khram Yai, and a bank, with depths of less than 5 fathoms (9m1) over it, extends about 2 miles farther northward.

Ko Kramnoi, 176 feet (53m6) high, lies on a rocky bank about half a mile northward of the north-eastern extremity of Ko Khram Yai.

Chong Khram.—Dangers.—Light.—Chong Khram is entered

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Chart 3727, plan of Approaches to Satahib bay.

from southward between Hlaem Pu Chao (*Lat. 12° 39′ N., Long. 100° 51′ E.*) and the southern extremity of Ko Khram Yai. On the western side of the strait, Hin Yai and Hin Tar, 9 and 12 feet (2m7 and 3m7) high, respectively, lie 3 cables south-eastward and 4 cables eastward of the southern extremity of Ko Khram Yai. The south-eastern side of Ko Khram Yai is fringed by a reef which extends about 2½ cables offshore, and a bank, with depths of from 3 to 6 fathoms (5m5 to 11m0) over it, extends 1¼ miles south-eastward.

Ko Ra (Ea-ra), 182 feet (55m5) high, lies near the middle of the fairway of the strait about 2¼ miles eastward of the southern extremity of Ko Khram Yai; the southern, northern and eastern sides of Ko Ra are fringed by a reef. Hin Kee-Sua lies on a reef about 2 cables north-eastward of Ko Ra.

A light is exhibited, at an elevation of 22 feet (6m7), from a white concrete tower with black bands, 22 feet (6m7) in height, on Hin Kee-Sua.

Hin Kee-Plar, 9 feet (2m7) high, lies about one mile north-westward of Ko Ra; an islet 32 feet (9m8) high, lies about 2½ cables eastward of Hin Kee-Plar. Hin Keo-Samut, with a depth of less than 6 feet (1m8) over it, lies about 4 cables north-north-westward of Ko Ra.

Ao Tung Kai Tia, on the eastern side of Chong Khram, is entered between Hlaem Pu Chao and Hlaem Taphao, the southern extremity of a promontory, about one mile northward. Ko Kai Tia, a small islet, lies in the south-eastern part of this bay, on the shore bank. The head of the bay is low and wooded, and a bank, with depths of 18 feet (5m5) and less over it, extends as far offshore as the line joining the entrance points.

The above-mentioned promontory extends about one mile westward from the mainland and attains an elevation of 615 feet (187m4); its north-western extremity lies about three-quarters of a mile northward of its southern extremity. Ao Tungproang, which is shallow, is entered between the north-western extremity of the promontory and a point on the coast 8½ cables northward. The head of this bay dries out for a distance of about half a mile, and a bank, with depths of 3 fathoms (5m5) and less over it, extends half a mile farther.

Secure anchorage may be obtained by small vessels in Ao Tungproang (*Lat. 12° 41′ N., Long. 100° 51′ E.*).

A reef extends about 4 cables from the north-eastern side of Ko Khram Yai.

Hin Wualai Quaiwing, which partly dries, lies about one mile north-north-eastward of Hin Kee-Plar.

Between the northern entrance point of Ao Tungproang and a point about 3 miles northward, the coast is composed of high rocky bluffs, with sandy bays between; a bank, with depths of less than 3 fathoms (5m5) over it, extends about 5½ cables westward from the last mentioned point. Ko Klet (Kledkeo), 242 feet (73m8) high, lies about half a mile northward of the same point, separated from the mainland by Klet (Kledkeo) passage. A mooring buoy is situated in this passage about 1¾ cables southward of the eastern extremity of Ko Klet. Khao Lem Kham (Lem-kharm), 773 feet (235m6) high, rises steeply from a cliffy coast, 8½ cables east-north-eastward of Ko Klet.

Tidal streams.—The flow sets northward through Chong Khram when the tide is rising at Bangkok bar and southward when it is falling

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Chart 3727, plan of Approaches to Satahib bay.

there, at the following approximate rates:—Westward of Ko Ra, 2 to 3 knots—Abreast Hin Wualai Quaiwing, 2 to 4 knots—Between Ko Ra and the mainland, one to 2 knots—Half a mile from the mainland eastward of Hin Wualai Quaiwing, one to 2 knots—Half a mile eastward of Ko Kramnoi, one to 2 knots.

Chart 2720.

Outlying islets and dangers.—A chain of islets and dangers extends north-north-westward from Ko Khram Yai and lies about 11 miles offshore; Ko Lin (Rin) (*Lat. 12° 48′ N., Long. 100° 41′ E.*), 343 feet (104^{m}5) high, is the southernmost of the chain and lies about 6 miles north-north-westward of Ko Khram Yai. Tree rock, 41 feet (12^{m}5) high, with a rock above water close northward, lies about half a mile southward of Ko Lin. White rock, 37 feet (11^{m}3) high, lies about three-quarters of a mile north-eastward of the same islet, with another rock above water nearly midway between.

Ko Man Wichai (Manvichai), 205 feet (62^{m}5) high, lies about 4 miles north-north-westward of Ko Lin. Ko Kroeng Badan (Grüngbadal), 159 feet (48^{m}5) high, lies about one mile northward of Ko Man Wichai. A spit, with a depth of 3½ fathoms (6^{m}4) over it, at its extremity, extends about three-quarters of a mile southward from Ko Kroeng Badan, and two islets, one of which is named Ko Hu-chang, lie close off the northern end of the same islet. Ko Phai (Pai), 511 feet (155^{m}8) high at its southern end, lies about three-quarters of a mile northward of Ko Kroeng Badan. A bank, with depths of less than 5 fathoms (9^{m}1) over it, extends over one mile northward from Ko Phai.

A light is exhibited, at an elevation of 512 feet (156^{m}1), from a white concrete tower, 39 feet (11^{m}9) in height, situated near the middle of Ko Phai.

Ko Luam Yai (Luem), 439 feet (133^{m}8) high, the northernmost of these outlying islets, lies about one mile north-westward of Ko Phai. A bank, with depths of 3 fathoms (5^{m}5) and less over it, extends about 1¼ miles northward from Ko Luam Yai, and depths of less than 6 fathoms (11^{m}0) extend about 1½ miles farther northward. Between this bank and the bank extending northward from Ko Phai there is a narrow channel, on the western side of which, about a quarter of a mile eastward of Ko Luam Yai, there is a rock above water. The southern and eastern sides of Ko Luam Yai are steep-to; the islet is bold and cliffy, its summit is dome-shaped and forms one of the principal landmarks at the head of the Gulf of Thailand.

Coast.—Islands and dangers.—Lights.—A bay is entered between Ko Klet and Hlaem Phathaya (Pataya), about 9½ miles northward. The land round the bay is low and wooded, and depths of less than 6 fathoms (11^{m}0) extend offshore beyond the line joining the entrance points. A shoal, with a depth of 2½ fathoms (4^{m}6) over it, lies about 3 miles north-north-eastward of Ko Klet and the same distance offshore; another shoal, with a depth of 1½ fathoms (2^{m}7) over its northern end, lies about 2½ miles southward of Hlaem Phathaya. There are numerous fishing stakes in the bay during the North-east monsoon.

Ko Rang Kwien, 24 feet (7^{m}3) high, lies outside the southern portion of the bay, about 3¼ miles north-westward of Ko Klet.

A light is exhibited, at an elevation of 48 feet (14^{m}6), from a white concrete pile beacon on Ko Rang Kwien.

Chart 2414.

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Chart 2720.

Hlaem Phathaya (*Lat. 12° 55′ N., Long. 100° 50′ E.*) consists of a number of low rocky bluffs; a hill, 323 feet (98m4) high, lies about 8 cables within the point. Between Hlaem Phathaya and Hlaem Chabang (Krabang), about 9 miles northward, there is a bay, the shore of which is low and wooded. A bank, with depths of less than 3 fathoms (5m5) over it, extends as much as 2 miles offshore. Ko Chune, low and rocky, lies about 1½ miles northward of Hlaem Phathaya, and a rock, with a depth of less than 6 feet (1m8) over it, lies about 1¼ miles eastward of Ko Chune, close offshore.

A light is exhibited, at an elevation of 32 feet (9m8), from a white concrete tower, 13 feet (4m0) in height, on Ko Chune.

About 3½ miles north-eastward of Hlaem Phathaya is Hlaem Khwan (Kwan), on which stands Ban Sarai. A shoal, with a depth of 1¾ fathoms (3m2) over its northern end, lies about half a mile southward of Hlaem Chabang.

Off-lying islets and dangers.—Buoys.—Ko Lan, 668 feet (203m6) high, lies about 4 miles westward of Hlaem Phathaya. A bank, with depths of less than 4 fathoms (7m3) over it, extends nearly 2½ miles northward from the north-western side of Ko Lan. On the eastern side of the islet is a village. Ko Sak (Sark) lies about half a mile northward of Ko Lan, and Ko Khrok (Krog) lies about three-quarters of a mile eastward of the north-eastern side of Ko Lan. Pra Nang rock, with a depth of 1¾ fathoms (3m2) over it, lies about half a mile southward of Ko Khrok, and is marked on its northern side by a white spherical buoy, surmounted by a triangle. East Lan rock, with a depth of 3 feet (0m9) over it, lies midway between Ko Khrok and Hlaem Phathaya (*Lat. 12° 55′ N., Long. 100° 50′ E.*), and is marked on its eastern side by a white spherical buoy.

A shoal, with a depth of 4¾ fathoms (8m7) over it, lies about one mile northward of Ko Khrok, and a shoal, with a depth of 5½ fathoms (10m1) over it, lies about 1½ miles farther north-north-eastward.

Ko Nok (Nark) lies about 4½ miles south-westward of Hlaem Chabang. A bank, with depths of less than 5 fathoms (9m1) over it, extends about one mile northward from Ko Nok, and also a short distance southward from the islet. A bank, with a depth of 6 fathoms (11m0) over it, lies about 1½ miles southward of Ko Nok.

Anchorage.—There is good anchorage in the South-west monsoon for vessels with local knowledge, close under the north-eastern side of Ko Lan.

Coast.—From Hlaem Chabang to Bang Phra (Pra), a town, connected to the general telegraph system, about 9 miles north-eastward, the coast consists of shallow sandy bays separated by rocky points. A range of hills lies a short distance inland along this stretch of coast, the highest, Khao Chalak (Cha-lark), having an elevation of 1,022 feet (311m5), and lying about 1½ miles south-south-eastward of Bang Phra.

Ko Loi, 57 feet (17m4) high, lies about 6½ miles north-north-eastward of Hlaem Chabang, and about 4 cables offshore; it is connected to the coast by a pier which also extends a short distance seaward from the islet. The town of Siracha (Srimaharacha) is situated on the coast close southward of the root of this pier.

Between Ko Loi and Hlaem Som (Sah) Muk, 241 feet (73m5) high, and appearing like an island, situated about 8½ miles northward, there is a bight, the shores of which are low and wooded, and fringed by a

Chart 2414.

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Chart 2720.

bank, with depths of less than 3 fathoms (5m5) over it, extending nearly 2 miles offshore in places. A rock, with a depth of less than 6 feet (1m8) over it, lies on this bank about one mile westward of Bang Phra. Khao Bang Pla Soi Yai, 2,497 feet (761m1) high, lies about 8½ miles east-south-eastward of Hlaem Som Muk (*Lat. 13° 19′ N., Long. 100° 53′ E.*).

Anchorages.—There is anchorage for small vessels with local knowledge, in a depth of 3 fathoms (5m5), with Ko Loi bearing 080°, distant half a mile. Small vessels may also obtain anchorage about 3 miles south-south-westward of Hlaem Som Muk, in a depth of about 4 fathoms (7m3).

Chart 3727, plan of Goh Sichang harbour.

Off-lying islands and dangers.—Lights.—Buoy.—Ko Thai Khang Khao (Kangkao), 245 feet (74m7) high, is the southernmost island of a group lying about 4 miles off the mainland between Hlaem Chabang and Ko Loi. Ko Thai Khang Khao, which lies 4¼ miles west-north-westward of Hlaem Chabang, is fringed by a narrow reef, and a rocky bank, with depths of less than 3 fathoms (5m5) over it, extends 1½ cables offshore in places. Ko Tai Ta-mun is joined to the south-western extremity of the island by a narrow reef.

A light is exhibited, at an elevation of 95 feet (29m0), from a white concrete pile beacon, on the summit of Ko Tai Ta-mun.

Ko Sichang, the largest of the group, lies about 3¾ cables northward of Ko Thai Khang Khao. In the middle of the southern part of the island is a rocky table-land, 170 feet (51m8) high, covered with trees and bushes and surrounded by hills which rise steeply from the coast. The summit of Ko Sichang, 626 feet (190m8) high, is situated near the northern end about 5½ cables southward of its northern extremity. On the extremity of the reef which fringes the southern end of Ko Sichang is Ko Yai tao, 55 feet (16m8) high. The south-eastern side of Ko Sichang is fringed by a reef, and depths of less than 3 fathoms (5m5) extend nearly 2 cables offshore in places. Hin Ta sin, which dries about 8 feet (2m4), lies about 6 cables north-eastward of the southern extremity of Ko Sichang and about one cable offshore.

Hlaem Wang, at the extremity of which is a prominent obelisk, is a narrow promontory on the eastern side of Ko Sichang, about 1½ miles north-north-eastward of its southern extremity. On the northern side of Hlaem Wang and about 1¼ cables westward of its outer extremity is Asdang pier, about 100 yards (91m4) long.

A light is exhibited, at an elevation of 37 feet (11m3), from a white masonry column on Hlaem Wang.

The north-eastern side of Ko Sichang is fringed by a reef, and a bank, with depths of less than 3 fathoms (5m5) over it, extends about 2½ cables offshore.

A rock, with a depth of 2 feet (0m6) over it, lies 6 cables north-north-westward of Hlaem Wang and 1¼ cables offshore.

Between a point situated about 7 cables north-westward of Hlaem Wang and the northern extremity of Ko Sichang there are two bights. Ban Tar Devawong stands along the shore of the southern bight, about 1½ cables north-westward of the above-mentioned point. There is a pier near the Custom house at Ban Tar Devawong. Ban Tar Bhanurangsi, abreast which there is another pier, is situated about 3½ cables north-north-westward of Ban Tar Devawong.

Chart 2414.

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Chart 3727, plan of Goh Sichang harbour.

Hlaem Tham Pang (*Lat. 13° 09′ N., Long. 100° 48′ E.*), a narrow promontory with a steep hill at its extremity, extends a quarter of a mile from the western side of Ko Sichang, westward of Hlaem Wang. Ao Tham Pang is entered between the extremity of Hlaem Tham Pang and a point about half a mile south-eastward.

Ko Lan Dauk Mai (Ran Dokmai), 55 feet (16m8) high, and fringed by a narrow reef, lies 8 cables eastward of Hlaem Wang. A bank, with depths of less than 3 fathoms (5m5) over it, extends about one cable northward from the islet, and with depths of 6 fathoms (11m0) for one cable farther.

Ko Kham Yai, 212 feet (64m6) high and fringed by a reef, lies about 8½ cables north-north-eastward of Hlaem Wang. In the channel between the island and Ko Sichang are several detached shoals, with depths of less than 3 fathoms (5m5) over them, the positions of which can best be seen on the chart. An obelisk, standing at the northern end of Ko Kham Yai, is prominent from northward. A bank, with depths of less than 3 fathoms (5m5) over it, extends 6¾ cables north-north-westward from Ko Kham Yai. Hin Gong Nai, which partly dries, lies on this bank, about 3¼ cables from the obelisk.

A light is exhibited, at an elevation of 21 feet (6m4), from a white concrete tower situated on Hin Gong Nai (*Lat. 13° 11′ N., Long. 100° 49′ E.*).

A bank, with depths of less than 3 fathoms (5m5) over it, extends about 2¼ cables southward from Ko Kham Yai.

Ko Prong, 16 feet (4m9) high, wooded and fringed by a narrow reef, lies about 3¼ cables eastward of Ko Kham Yai. Ko Kham Noi, 68 feet (20m7) high and fringed by a narrow reef, lies about 2¾ cables north-eastward of Ko Kham Yai. Two concrete oil tanks are situated on the southern side of the island.

Hin Gong Nok, nearly awash, lies about three-quarters of a mile northward of the northern extremity of Ko Sichang, and is marked on its western side by a white spherical buoy with a topmark.

Hin Sampayoe (Sampayeu), 6 feet (1m8) high, and fringed by a reef, lies about 6 cables north-north-westward of the north-western extremity of Ko Sichang.

A light is exhibited, at an elevation of 50 feet (15m2), from a white masonry tower, 15 feet (4m6) in height, on Hin Sampayoe.

Anchorages.—During the North-east monsoon, the best anchorage for small vessels with local knowledge is, in a depth of over 3 fathoms (5m5), with the southern extremity of Ko Kham Yai bearing 045°; larger vessels generally anchor, in a depth of over 5 fathoms (9m1), with the same point bearing 315°.

During the South-west monsoon, small vessels with local knowledge generally anchor between a line drawn from the north-eastern extremity of Ko Sichang to the northern extremity of Ko Kham Yai, and a line drawn from the south-western extremity of Ko Kham Yai to the point on Ko Sichang, about 6 cables south-westward; larger vessels can anchor, in a depth of 5 fathoms (9m1), with the north-eastern extremity of Ko Sichang bearing 253°, distant about 1¼ miles.

Anchorage, well sheltered in both monsoons, may be obtained between Hlaem Wang and Ko Lan Dauk Mai, in depths of from 5 to 9 fathoms (9m1 to 16m5).

Charts 2720, 2414.

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Chart 3727, plan of Goh Sichang harbour.

Ko Sichang harbour.—Limits.—The limits of Ko Sichang harbour are defined as follows:—

North Limit.—A line drawn 090° from the northern end of Hin Sampayoe.

East limit.—A line drawn 000° and 180° from the eastern extremity of Ko Lan Dauk Mai.

South limit.—A line drawn 090° from the obelisk on Hlaem Wang.

West limit.—A line joining Hin Simpayoe (*Lat. 13° 11′ N., Long. 100° 48′ E.*) and the north-western extremity of Ko Sichang.

The area in which ballast may be discharged, eastward of Ko Kham Noi and Ko Prong, is indicated on the chart by pecked lines.

Ocean steamers complete their loading in the harbour after leaving Bangkok, or discharge some of their cargo before proceeding there. Cargo can be brought out to, or taken away from, such vessels in steam or sailing lighters, with both of which Bangkok is well supplied.

For maximum draught of vessels for crossing the bar of Maenam Chao Phraya, *see* page 160.

Landing can be effected at Asdang pier, or at the pier at Ban Tar Devawong, but, at the latter, the landing is not so good.

Communication.—Supplies.—Ko Sichang is connected to the general telegraph system.

There is a radio station at Ko Sichang, *see* page 28.

A small supply of fruit and eggs may be obtained locally.

Chart 2720.

Coast.—Between Hlaem Som Muk and Hlaem Talat Nok, the eastern entrance point of Maenam Bang Pakong (Pa-Kong), about 9½ miles north-north-eastward, there is a shallow bay. The town of Ang Sila (Ang Hin) stands about 1¾ miles north-eastward of Hlaem Som Muk. Plasoi (Cholburi) is situated at the head of the bay, about 3½ miles east-north-eastward of Ang Sila; it is of considerable importance, but can only be reached from seaward at high water. A mud flat, which dries, extends about 1¼ miles from the south-eastern shore of the bay, and about 2 miles in places from the north-eastern shore. Khao Pla Bat, 477 feet (145m4) high, lies close to the coast, a short distance north-eastward of Plasoi, and is the northern termination of the high land on the eastern side of the Gulf of Thailand.

Anchorage.—There is anchorage for small vessels with local knowledge off Ang Sila, in a depth of 3 fathoms (5m5), about one mile offshore.

Chart 2720, plan of Bang Pa-Kong river.

Maenam Bang Pakong.—Beacons.—Maenam Bang Pakong (Bang Pa-Kong) is entered between Hlaem Talat Nok and a point about 1¼ miles westward. The river is reported to be navigable by small craft as far as Chachoeng Sao, situated about 15 miles from the mouth. The banks of the river near its mouth and the coast for about 4 miles both southward and westward of the entrance, consist of mangrove. Mudbanks, which dry, extend about one mile offshore southward of Hlaem Talat Nok (*Lat. 13° 28′ N., Long. 100° 56′ E.*) and nearly one mile offshore westward of the western entrance point. The bar is nearly 4 miles wide, with a least depth of 2 feet (0m6) over it. There are numerous fishing stakes in the approach to the river.

Above the bar, red beacons mark the western side of the channel, and white beacons the eastern side.

Chart 2414.

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Chart 2720.

Coast.—Between the mouth of Maenam Bang Pakong and the mouth of Maenam Chao Phraya, about 20 miles westward, the coast is low and bordered with mangroves; it is fringed by a mudbank, which dries, extending as much as one mile offshore, and a bank, with depths of less than 6 fathoms (11m0) over it, extends about 6 miles offshore. A river discharges into the Gulf about 9 miles westward of Hlaem Talat Nok. Bang Hia stands on the eastern bank of the river about half a mile inland.

For description of Maenam Chao Phraya, *see* page 160.

Chart 2414.

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CHAPTER V

COASTS OF SOUTH AND CENTRAL VIET-NAM—POINTE CAMAU TO CAP LAY

Chart 2660a.

SOUTH VIET-NAM.—Numerous rivers and canals, most of which lead into Le Mékong, intersect the interior of South Viet-Nam, formerly Cochin China, in every direction. Some of these are navigable by small vessels and nearly all are navigable by the native craft by which the commerce of the country is carried on. Most of the trade passes through these numerous waterways to Saïgon.

In the interior there are great mountain ranges, which, in the South-west monsoon, are hidden by mist. The sandy beaches on the coast are generally backed by wooded sandhills.

The coast of South Viet-Nam from Pointe Camau (*Lat. 8° 36′ N., Long. 104° 42′ E.*) to Rivière de Saïgon is low, inundated by the sea at times, and in most parts the tops of the trees are only just visible at a distance of 11 or 12 miles. The whole coast is fringed by banks of sand, with depths of from one to 3 fathoms (1^m8 to 5^m5) over them, and depths of from 6 to 10 fathoms (11^m0 to 18^m3) near their edges, which extend offshore for distances of from 10 to 12 miles in places. Seaward of these banks the depths are regular, over a bottom of fine sand and ooze.

As this coast is low and destitute of any particular marks, vessels proceeding to Cap St. Jacques (page 218) from westward should be careful to avoid it; after sighting Pulau Obi (page 168) they should make for Les Frères and Pulau Condore (page 108), and from the meridian of this latter group shape a course for Cap St. Jacques.

Caution.—Mariners are cautioned that unknown dangers may possibly exist in the approaches to the mouths of Le Mékong between the meridians of Pointe Camau and Pulau Cecir de Mer (page 112), and also that less depths may exist on the shoals already discovered than those indicated on the charts. A survey of this area, commenced in 1929, and still in progress in 1950, has disclosed several dangers hitherto unknown, especially east-south-eastward of Cap St. Jacques. The area delimited, on its western side by Charlotte bank (page 108), Pulau Condore, and Cap St. Jacques, and, on its eastern side, by the line drawn from Cap St. Jacques to Banc Callou (page 112), and produced, may, however, be considered the most free from danger.

Regulations.—The regulations for vessels approaching or visiting French ports are given on page 31.

Climate and weather.—*See* page 36.

Chart 1263.

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Chart 2414.

Off-lying banks.—Royalist bank, which lies about 27 miles south-eastward of Pulau Obi, and the 6-fathom (11m0) bank, about 20 miles farther east-north-eastward, are described on page 167.

Coast.—The mouth of Cua Bo Dé, a river connected with the Gulf of Thailand, lies about 33 miles east-north-eastward of Pointe Camau. The mouth of Song Ganh Hao lies about 20 miles north-north-eastward of Cua Bo Dé. About one mile offshore the entrance to Song Ganh Hao is obstructed by a bar, which dries at very low tides. During the South-west monsoon junks ascend Song Ganh Hao as far as the town of Camau, about 20 miles north-westward of the mouth, and can reach the Gulf of Thailand by inland waterways. Cua Tranh Dé (Ba tak), the south-westernmost mouth of Le Mékong, is situated about 105 miles north-eastward of Pointe Camau (*Lat. 8° 36′ N., Long. 104° 42′ E.*).

LE MÉKONG.—Le Mékong or Cambodge takes its source in the mountains of Tibet. At Pnom Penh, the capital of Cambodia, it divides into two branches which flow nearly parallel with one another through South Viet-Nam to the China sea.

Hau-Giang or Bassac, the western of these branches, takes a south-south-easterly direction from Pnom Penh as far as Chaudoc (Chaudok), a distance of about 55 miles. At Long-Xuyen, about 80 miles south-south-eastward of Pnom Penh, the Hau-Giang is connected by canal with Rach-Gia (page 172) in the Gulf of Thailand. At its mouth Hau-Giang is divided into two branches by islands; the south-western branch is named Cua Tranh Dé, and the north-eastern branch Cua Dinh An.

The eastern branch of Le Mékong, named Tien-Giang, takes a south-easterly direction from Pnom Penh. At Vinh-Long, about 105 miles south-eastward of the latter place, a branch diverges from Tien-Giang southward and discharges by two mouths, the south-western one of which is named Cua Cung Hau (Kua Kong hau) and the north-eastern one Cua Co Chien (Kua Ko Khien). About 8 miles eastward of Vinh-Long, two other branches, Song Ham Luong (Kua Ben nhau) and Song Balai, branch off from the main stream, and enter the sea about 32 miles south-eastward. The main stream flows on past the city of My-Tho, about 23 miles east-north-eastward of Vinh-Long, and finally enters the sea by two mouths, the south-western one of which is named Cua Dai and the north-eastern one, Cua Tieu (chart 1016).

At Pnom Penh, Le Mékong is joined by a river trending north-westward, which flows in that direction during the South-west monsoon and discharges into Le Mékong in the opposite season. Above Pnom Penh, Le Mékong is navigable without difficulty at high water as far as Kratié, a distance of about 105 miles.

Mouths of Le Mékong.—Buoys.—Light.—The principal mouths of Le Mékong have depths of from 7 to 10 feet (2m1 to 3m0) over their bars. Above the bars the depths increase in most of the rivers. The rivers can only be navigated by vessels with local knowledge.

The land in the vicinity of the mouths is low and subject to frequent changes in consequence of the accumulation of the alluvial deposit brought down by the different branches of the river.

The shallow banks fronting the mouths of Cua Tranh Dé and Cua

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Chart 2414.

Dinh An extend from 9 to 10 miles offshore. A shoal, which dries about 2 feet (0m6), lies 6 miles south-eastward of Pointe de Hoi Binh, the western entrance point of Cua Tranh Dé, and about 3 miles farther are the Bancs du Mythanh, with depths of from one to 6 feet (0m3 to 1m8) over them. A 5-foot (1m5) patch lies about 7 miles south-eastward of Pointe de Long Khanh, the eastern entrance point of Cua Dinh An, and Banc du Con Loi, which dries one foot (0m3), extends about 5½ miles south-eastward from the same point; its shoalest part lies about 1¾ miles from the point.

Cua Cung Hau and Cua Co Chien have a common entrance about 5 miles wide, about 21 miles north-eastward of Pointe de Long Khanh, the coast between being low and covered with mangrove. There is a clump of trees on the south-western bank of Cua Cung Hau and a fort on the north-eastern bank, at the south-eastern extremity of Ile Long Hoa which separates the two mouths. The shallow banks fronting these mouths extend from 10 to 11 miles offshore, and partly dry. The bar has a depth of 8 feet (2m4) over it. There are some fishing stakes in the entrance to Cua Cung Hau, within 2½ miles south-eastward of the south-western entrance point.

Two can buoys, each surmounted by a diamond, lie about 8¼ miles south-eastward and 2½ miles south-south-eastward, respectively, of the north-eastern entrance point of Cua Cung Hau.

The mouth of Song Ham Luong, about 8 miles north-north-eastward of that of Cua Cung Hau, is not buoyed and is difficult to enter; banks, with depths of less than 3 fathoms (5m5) over them, and parts of which dry, extend about 9 miles from the entrance.

Chart 1261.

Weser shoal, consisting of rocks, with depths of less than 6 feet (1m8) over them, lies on the coastal bank about 22 miles southward of Pointe du Mirador (*Lat. 10° 15′ N., Long. 106° 45′ E.*) and about 5½ miles offshore.

Song Balai, which is only available for small craft, is entered about 5½ miles north-eastward of the northern entrance point of Song Ham Luong.

Chart 1016.

Song Cua Dai and Song Cua Tieu are the two northernmost mouths of Tien-Giang, and are separated from one another by an island, named Cu Lao Loi Quan (Kulao Loi Kwan). Fishing stakes, some being old and invisible, are numerous on the banks fronting these entrances.

Song Cua Dai, the southern of these two mouths, is entered about 10 miles northward of the entrance to Song Balai. The coastal bank, with depths of less than 3 fathoms (5m5) over it, extends about 7 miles from the southern entrance point of Song Cua Dai, and Banc Llo-Llo, which dries 2 feet (0m6), extends 3¾ miles east-south-eastward from the eastern extremity of Cu Lao Loi Quan. Ile de Llo-Llo lies on the southern side at the outer end of the bank. Detached patches, which dry, lie on the bank which extends 6½ miles farther in the same direction, with depths of less than 3 fathoms (5m5) over it. Song Cua Dai has depths of 7 feet (2m1) over its bar on the southern side of this bank. The entrance is seldom used.

Song Cua Tieu, the north-easternmost mouth of Le Mékong, is the only one used by vessels proceeding to My-Tho and beyond. It is

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Chart 1016.

entered between the north-eastern extremity of Cu Lao Loi Quan and Pointe du Mirador, about 6½ cables north-north-eastward.

Banc Norodom, which dries 3 feet (0m9) on its southern edge, extends 4 miles south-eastward from Pointe du Mirador, and a bank, with depths of less than 3 fathoms (5m5) over it, extends about 9 miles farther south-eastward.

A light is exhibited, at an elevation of 102 feet (31m1), from a circular tower on a dwelling on piles, on the southern edge of Banc Norodom.

A red conical buoy, surmounted by a rectangle, is moored about 4 miles south-eastward of the light-structure on Banc Norodom. A black conical buoy is moored about half a mile south-westward of the light-structure. A beacon in ruins is situated on the north-eastern side of the channel about 1½ miles north-westward of the light-structure.

There is a depth of about 8 feet (2m4) over the bar of Song Cua Tieu, but vessels should not cross it without local knowledge. Abreast Pointe du Mirador (*Lat. 10° 16′ N., Long. 106° 45′ E.*) the channel is obstructed by fish traps, and, in this portion of the channel, large isolated fish stakes, invisible at night, constitute a danger to navigation. Above these obstructions navigation is reported to be simple. The river is tidal for about 50 miles from the entrance.

Pilots.—Pilots are stationed at Cap St. Jacques.

Chart 2660a.

Tidal streams.—Currents.—The water level in the river is low from February to June (lowest in April and May), and high from July to December (highest in August to October). During the low-river season the flow is affected by the tidal streams as far as Pnom Penh and Kompong Cham; during the high-river season the effect of the tidal streams is apparent to about Sadec. At and above Vinh Long the direction is always seaward.

Within the river mouths, the flow attains a rate of from 3 to 4 knots during the high-river season on the out-going stream. In the low-river season it may reach 1½ to 2½ knots with large tides. The out-going flow is always greater than the in-going.

In the high-river season, rates of from 3 to 4 knots may be expected between Vinh Long and Pnom Penh. The strongest streams are met between Kratié and Khône, where a rate of 9 knots may be attained in the narrows. Southward of Kratié rates do not usually exceed 6 knots in the narrows.

During the North-east monsoon the current sets south-westward towards the banks fronting the Mékong delta, over which there is then a considerable sea. The direction of the current varies from west-south-westward to south-south-westward, and its rate, which is greatly influenced by the force of the wind, is sometimes as much as 40 or 50 miles per day. Near the delta the rate of this current increases with the flood stream entering the rivers and decreases with the ebb.

Between Cua Cung Hau and Song Balai, during the North-east monsoon, in the month of April, an eddy current has been observed setting eastward at a rate of from 2 to 2½ knots. Southward of Cua Cung Hau this current was observed to set south-eastward and to diminish in rate; it disappears off Cua Dinh An and becomes the normal current.

Chart 1263.

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Chart 1016, plan of My-Tho road.

Towns.—The town and citadel of My-Tho is situated about 25 miles above the entrance of Song Cua Tieu. There are two wharves, one of which is about 150 feet (45m7) long. There are some floating sheers and a small floating dock. There is a hospital which can receive Europeans. Water may be obtained. Supplies are plentiful.

Chart 2414.

Vinh Long is situated about 23 miles above My-Tho. Water and a few provisions may be obtained. There are three wharves. There is a small hospital.

There is communication by river with My-Tho and Saïgon, and the town is connected to the general telegraph system.

Pnom Penh is the seat of the Government and the residence of the Commissioner of the Republic of Cambodia. Vessels with a draught of from 11 to 14 feet (3m4 to 4m3) can reach the town, according to the season.

There are two wooden pontoon wharves, about 180 feet (54m9) long. There is a crane with a lifting capacity of 10 tons. Water is supplied from a water boat, two days' notice being required. Vegetables may be obtained.

Pnom Penh has regular communication by river with the principal towns in the interior. For railway communication, *see* page 6.

Chart 1016.

RIVIÈRE DE SAÏGON.—The delta of Rivière de Saïgon lies in a bay which is entered between Pointe du Mirador and Cap St. Jacques, about 20 miles east-north-eastward. The delta is formed by numerous islands separated by rivers or canals which are connected with one another. The mouth of Song Soirap and Cua Dong Tranh, close eastward, are situated in the north-western part of the above-mentioned bay, and Baie de Ganh-Rai is situated in the north-eastern part, between Pointe de Ganh-Rai, 4¼ miles north-north-westward of Cap St. Jacques (*Lat. 10° 19′ N., Long. 107° 05′ E.*), and Pointe Can-Gio (Kangio), which lies about 5 miles west-north-westward of Pointe de Ganh-Rai. The main entrance to the river lies close northward of Pointe Can-Gio, and several smaller rivers discharge into Baie de Ganh-Rai.

Chart 2660a.

Rivière de Saïgon has its source somewhere north-eastward of Nui Ba Den, 3,165 feet (964m7) high, about 80 miles north-westward of Cap St. Jacques, and, passing eastward of it, pursues a winding course as far as Saïgon, situated about 35 miles north-westward of Cap St. Jacques. It is joined by Rivière Dong-nai (Don-nai), about 4 miles south-eastward of Saïgon.

Chart 1261.

Rivière Dong-nai irrigates all the northern part of the province of Bien-Hoa and passes the town of that name, situated about 11 miles north-north-eastward of Saïgon. This river does not become navigable till about 6 miles below Bien-Hoa; thence it follows a southerly direction, with several windings, for a distance of about 15 miles where it joins Rivière de Saïgon.

Chart 1016.

At Pointe Phami (Fami), about 5 miles below this junction, Rivière de Saïgon divides into two branches, the western branch being the

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Chart 1016.

Song Soirap. The eastern branch flows through the middle of the delta, previously mentioned, to the sea.

Western part of delta.—Beacon.—Buoy.—Song Soirap is entered between Doi Ba Cai, a point on the mainland, about 8½ miles northward of Pointe du Mirador and a point about 1¾ miles eastward. The channel leading to the entrance, about 1¼ miles wide, lies between the bank extending north-eastward from Banc Norodom (page 215) and the bank which extends about 12 miles south-eastward from the eastern entrance point of the river.

Banc du Soirap, with a least depth of about 4 feet (1m2) over it, lies at the extremity of the latter bank and about 9 miles west-south-westward of Cap St. Jacques. A bank, which dries 4 feet (1m2), extends about 3 miles south-eastward from the eastern entrance point of Song Soirap; between this bank and Banc du Soirap there are several patches, with depths of from one to 3 feet (0m3 to 0m9) over them. A black conical buoy is moored on the south-western side of Banc du Soirap, about 6¾ miles south-eastward of Cap de Dong Tranh.

In the fairway of the channel over the outer bar of Song Soirap there are depths of about 3 fathoms (5m5), but in the entrance to the channel there are some isolated patches, with a depth of only 2½ fathoms (4m6) over them.

In 1950, a vessel with a draught of 13 feet (4m0) could enter Le Soirap at all times of the tide.

A beacon stands on the eastern side of the channel, about 1¾ miles southward of Cap de Dong Tranh (*Lat. 10° 23′ N., Long. 106° 52′ E.*).

The bar is covered with fishing stakes and vessels should not enter the river without local knowledge.

The mouth of Song Vaïco is situated on the western side of Song Soirap, about 6 miles north-westward of Doi Ba Cai. Song Can Gioc (Rach Kat) is entered close northward of Song Vaïco, on the same side of the river; banks, which dry, extend about 4 cables from the entrance points of Song Can Gioc. Rach Vop (Giok) is entered on the northern side of Song Can Gioc, about half a mile within the entrance.

Abreast the entrance of Song Can Gioc there is a second bar, with a depth of about 2¾ fathoms (5m0) over it. There are fishing stakes on this bar; above it, as far as the junction with Rivière de Saïgon, the depths are greater.

Cua Dong Tranh is entered between Cap de Dong Tranh, on which stands the ruins of a light-tower, situated 10 miles north-eastward of Pointe du Mirador, and the eastern side of the coastal bank which extends from the eastern entrance point of Song Soirap. The channel is nearly half a mile wide at the entrance, with a depth in the fairway of about 3¾ fathoms (6m9). A bar, with depths of from 10 to 13 feet (3m0 to 4m0) over it, is situated from 4 to 7 miles south-eastward of the entrance. Cua Dong Tranh is only available to vessels with local knowledge.

Bancs de Can-Gio (Kangio), which dry from one to 8 feet (0m3 to 2m4), extend nearly 2 miles offshore between Cap de Dong Tranh and Pointe Can-Gio, 6¼ miles east-north-eastward, and a bank, with depths of less than 5 fathoms (9m1) over it, extends about 7 miles farther offshore; near the extremity of this bank is Banc du Sud-ouest (South-west bank), with a least depth of 14 feet (4m3) over it.

Charts 1261, 2660a, 1263.

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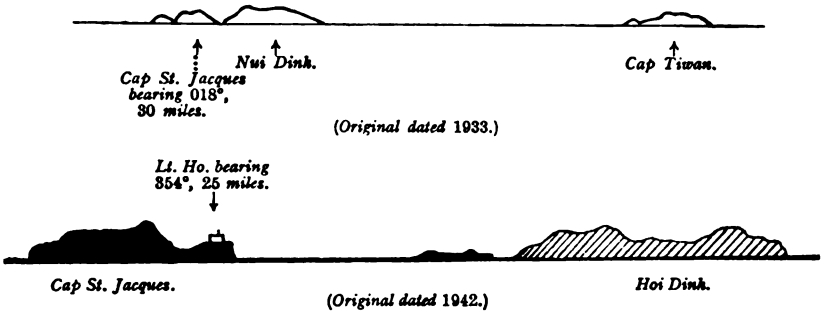
Chart 1016.

Pointe Can-Gio is low, covered with brushwood and not easily seen. There are fishing stakes between Bancs de Can-Gio and Banc du Sud-ouest. The eastern sides of these banks are described on page 219.

Eastern part of delta. — Approaches. — Dangers. — Lights. — Buoyage.—The eastern mouths of the delta of Rivière de Saïgon are approached between Cap St. Jacques and Banc du Sud-ouest.

Cap St. Jacques is the southern extremity of an island, on the western side of which are three steep hills, which are the first high land seen when approaching from south-westward and appear as islands at a distance. Nui Vung Tau, 597 feet (182m0) high, the southernmost of the three hills, lies nearly one mile north-north-westward of Cap St. Jacques; Nui Hoa (Hon) Sup, 814 feet (248m1) high, lies about 1½ miles north-north-westward of Nui Vung Tau, and Nui Vung Mai, 791 feet (241m1) high, about one mile farther north-north-westward. *See* view A on chart 1261.



Îlot Archinard, 46 feet (14m0) high, lies about 4 cables north-eastward of Cap St. Jacques, on the outer edge of a reef which extends 2 cables offshore, and another islet lies about 1½ cables south-westward of Îlot Archinard, close offshore. A bank extends about half a mile east-south-eastward from Îlot Archinard and on its outer end is a depth of 3½ fathoms (6m4). There is a rock, with a depth of 3½ fathoms (6m4) over it, about a quarter of a mile south-eastward of Cap St. Jacques.

Chart 1261.

Bancs de l'Astrolabe, about 43 miles east-south-eastward of Cap St. Jacques (*Lat. 10° 19′ N., Long. 107° 05′ E.*), are described on page 112. The dangers lying off the coast north-eastward of Cap St. Jacques are described on page 231.

Banc du Requin, with a depth of 4 fathoms (7m3) over it, and a 4-fathom (7m3) patch lie about 5½ and 3½ miles, respectively, east-south-eastward of Cap St. Jacques.

Charts 1016, 1261.

A bank, with a least depth of 4¼ fathoms (7m8) over it, lies about 2¼ miles south-eastward, and Banc du Cap, a detached 4-fathom (7m3) patch, lies about 2 miles south-south-eastward, of Cap St. Jacques.

Banc Formosa, with a depth of 8 feet (2m4) over it, lies about one mile south-eastward of Cap St. Jacques; a rock, with a depth of 5 feet (1m5) over it, lies about one mile eastward of Banc Formosa

Charts 2660a, 1263.

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Charts 1016, 1261.

and a bank, with depths of less than 5 fathoms (9m1) over it, extends about 1½ miles farther east-north-eastward.

Chart 1016.

Banc Ranza, with a least depth of 2¾ fathoms (5m0) over it, lies about 8 cables westward of Cap St. Jacques, and there are depths of 4½ fathoms (8m2) over the north-western end of the bank, and about 3 cables eastward of the track recommended, which is indicated on the chart by a pecked line.

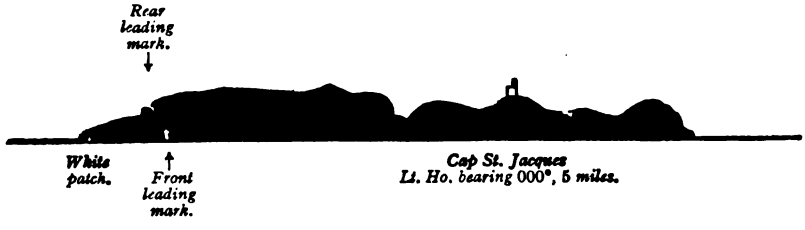
A black conical light-buoy, exhibiting a *green flashing* light, showing *three flashes*, is moored westward of Banc Ranza, close eastward of the recommended track, and about 1½ miles westward of Cap St. Jacques.

A green pillar buoy is moored about 1½ miles west-north-westward of Cap St. Jacques (*Lat. 10° 19′ N., Long. 107° 05′ E.*).

On the western side of the approach, there are several shoals, with depths of 5 fathoms (9m1) and less over them, which lie near the eastern end of Banc du Sud-ouest (page 217). The position and extent of these shoals can best be seen on the chart, the easternmost, with a depth of 5 fathoms (9m1) over it, being situated about 1½ miles south-westward of Cap St. Jacques; a bank, with depths of from about 5 to 5½ fathoms (9m1 to 10m1) over it, lies about 1½ miles southward of Cap St. Jacques, and extends about 3 cables from each side of the recommended track.

A light is exhibited, at an elevation of 633 feet (192m9), from a white masonry tower, about 59 feet (18m0) in height, on the summit of Nui Vung Tau. The red roof of a building about one mile northward of the lighthouse, was, in 1945, prominent.

Leading lights are established on the eastern side of the approach. The front light is exhibited, at an elevation of 66 feet (20m1), from a white square tower, about 41 feet (12m5) in height, close southward of Mui Da Cao Trang, situated about 2½ miles north-north-westward of Cap St. Jacques. The rear light is exhibited, at an elevation of 426 feet (129m8), from a white square tower over a dwelling, about 42 feet (12m8) in height, with a square daymark, painted with black and white horizontal bands, situated on the western slope of Nui Vung Mai, about 1¼ miles north-north-westward of the front light. These lights, in line, bear 353°. In 1948, the front light was reported to be irregular.



Leading marks, in line bearing 353°.

Between Cap St. Jacques and Pointe des Carrières (Quarry point), about 9 cables north-westward, the coastal bank, with depths of less than 5 fathoms (9m1) over it, extends about 2½ cables offshore. Two detached shoals, with depths of 3 fathoms (5m5) over them, lie, respectively, about 2 and 3½ cables south-westward of Pointe des

Charts 2660a, 1263.

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Chart 1016.

Carrières. A shoal, with a depth of 2¾ fathoms (5m0) over it, lies about 3½ cables north-westward of Pointe des Carrières, and about 1¾ cables offshore.

A patch of foul ground lies about 2½ miles north-westward of Cap St. Jacques (*Lat. 10° 19′ N., Long. 107° 05′ E.*).

The coast between Pointes des Carrières and Pointe de Ganh-Rai is mostly fringed by a reef which extends about one cable offshore, and is indented by two shallow bays, the heads of which are sandy.

Baie des Cocotiers (Cocoanut bay), the southern bay, is entered about 1¼ miles north-north-westward of Cap St. Jacques. Sunken rocks extend about half a cable from the northern entrance point. Ville du Cap, the sanatorium of South Viet-Nam, stands at the head of the bay. Provisions are plentiful.

Mui Da Cao Trang (Grand Éperon point) lies nearly midway between Cap St. Jacques and Pointe de Ganh-Rai. Fausse baie (False bay), the northern of the two bays mentioned above, lies between Mui Da Cao Trang and Pointe Vung, about one mile north-north-westward.

Banc du Phare, with depths of from one to 2 feet (0m3 to 0m6) close to its eastern edge, lies close eastward of Bancs de Can-Gio (page 217) and is separated from Pointe Vung by a deep channel about 1½ miles wide. The northern end of Banc du Phare, with a depth of one fathom (1m8) over it, lies midway between Pointe Ganh-Rai and Pointe Can-Gio. There are fishing stakes on the bank.

A conical light-buoy, painted red, exhibiting a *red group flashing* light, showing *two flashes*, is moored about one mile westward of Nui Vung Mai light-tower.

A light is exhibited, at an elevation of 62 feet (18m9), from a white framework pylon with black bands, about 56 feet (17m1) in height, on Pointe du Lazaret, about 1¼ cables south-westward of Pointe Ganh-Rai. In 1948, this light was reported unreliable.

Can-Gio light is exhibited, at an elevation of 57 feet (17m4), from a truncated tower over a dwelling on piles, about 65 feet (19m8) in height, at the northern extremity of Banc du Phare, about 2¼ miles east-south-eastward of Pointe Can-Gio.

Pilotage.—Pilotage is compulsory in Rivière de Saïgon. The pilot station is at Baie des Cocotiers, which is connected by telephone to the signal station on Cap St. Jacques, off which pilots embark. The pilot will hand to the master of every vessel a copy of the local signals and port regulations.

Signals.—Storm signals.—Near the lighthouse on Nui Vung Tau there is a signal station with which vessels can communicate by the International Code of Signals.

Storm signals are displayed near this lighthouse, which is connected to the telegraph system.

Climatic table.—*See* page 56.

Anchorages.—Vessels can anchor anywhere off the coast of the high land north-north-westward of Cap St. Jacques (*Lat. 10° 19′ N., Long. 107° 05′ E.*), in a depth of about 7 fathoms (12m8), mud, about one mile offshore, care being taken to avoid the patch of foul ground mentioned above. There is often considerable swell during the South-west monsoon, but the anchorage is excellent during the North-east monsoon.

Small vessels will find a convenient anchorage about 2 cables from

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Chart 1016.

the light-structure on the mole in Baie des Cocotiers, with it in line with Nui Vung Tau lighthouse, bearing 123°; during the South-west monsoon, a better anchorage will be found off the mouth of Rach Dua (*see* below), but local knowledge is essential.

Vessels intending to anchor, and not requiring a pilot, should display, by day, flag " D " of the International Code of Signals and, by night, exhibit a *red* light well above the bulwarks.

Directions for entering are given on page 228.

Baie de Ganh-Rai. — Beacons. — Buoyage. — Lights. — For the entrance to Baie de Ganh-Rai, *see* page 216. The coastal bank, with depths of 2½ fathoms (4m6) at its outer edge, extends from the southern side of Baie de Ganh-Rai to a position about 3½ cables north-westward of Pointe Ganh-Rai, and is marked by a red can buoy, situated about 4 cables north-north-westward of the point. Île de Ben Dinh lies about half a mile eastward of Pointe Ganh-Rai, and is separated from the land southward by Rach Ben Dinh.

A bank, which dries 3 feet (0m9), extends about one cable from the north-eastern side of Pointe Ganh-Rai, and another bank, which dries 6 feet (1m8), extends about half a mile from the north-western side of Île de Ben Dinh, and there are depths of only one foot (0m3) about 4 cables farther north-westward. There are fishing stakes off the entrance. Beacons mark the channel between the drying banks leading to Rach Ben Dinh.

Song Dinh is entered between the northern extremity of Île de Ben Dinh and the southern extremity of Culao (Kulao) Tau, an island, about 6 cables east-north-eastward. A bank, which dries 6 feet (1m8), extends about one mile from the western side of Culao Tau; the southern edge of this bank is marked by a beacon situated about one cable off the south-western extremity of Culao Tau. Rach Dua, where there is a jetty at which landing can be effected in all weathers, is situated on the southern bank of Song Dinh, about 3 cables east-south-eastward of the southern extremity of Culao Tau. The bar of Song Dinh is about three-quarters of a mile wide, with a least depth of 1¼ fathoms (2m3) over it.

Leading lights are situated on the southern bank of Song Dinh, about 2¼ miles eastward of Pointe Ganh-Rai light. The front light is exhibited, at an elevation of 30 feet (9m1), from a white metal pylon, about 32 feet (9m8) in height, and the rear light, at an elevation of 50 feet (15m2), from a similar structure, about 53 feet (16m2) in height, about one cable south-eastward of the front light. These lights in line, bearing 120°, lead into the entrance of Song Dinh from its bar.

Song Cha Va is entered over a bar, with a depth of 13 feet (4m0) over it, about 2 miles westward of the north-western extremity of Culao Tau, and extends eastward between the north-eastern extremity of Culao Tau and the southern end of an island, about one mile northward. Off the southern side of the latter island, a bank, which dries 4 feet (1m2), extends about 8 cables, leaving a channel about a quarter of a mile wide between it and the drying bank extending westward from Culao Tau (*Lat. 10° 24′ N., Long. 107° 06′ E.*).

A red can buoy is moored on the north-western side of the channel leading into Song Cha Va and Song Dinh, about 1¼ miles north-westward of Pointe Ganh-Rai; this buoy also marks the southern end of

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Chart 1016.

the banks extending southward from the mouth of Rach Ong Ben, described below.

Small vessels with local knowledge can anchor during the North-east monsoon off the mouths of Song Dinh and Song Cha Va.

Nui Nua (*Lat. 10° 27′ N., Long. 107° 05′ E.*), 591 feet (180m1) high, lies about 2½ miles north-north-westward of the north-eastern extremity of Culao Tau, and Nui Ba Lai, 260 feet (79m2) high, lies about 1½ miles west-north-westward of Nui Nua. Nui Ong Cau (Nui Chau) (chart 1261), 1,673 feet (510m0) high, lies near the south-eastern end of Nui Dinh, a range about 6½ miles north-eastward of Nui Nua.

Between the mouth of Rach Ben Go (Song Bai Meu), near the south-western extremity of the island on the northern side of Song Cha Va, and the eastern entrance point of Rach Ong Ben (Song Ben), about 3½ miles north-westward, the coastal bank, which dries from one to 6 feet (0m3 to 1m8), extends from 1½ to 6 cables offshore and depths of less than 3 fathoms (5m5) extend about 2 miles. There are fishing stakes on this bank.

A rock, with a depth of 4 feet (1m2) over it, lies about 3 miles southward of the eastern entrance point of Rach Ong Ben and nearly 2 miles east-north-eastward of Can-Gio lower light (page 220). Between the rock and the light-structure there is a deep channel about one mile wide.

The western entrance point of Rach Ong Ben is about three-quarters of a mile westward of the eastern entrance point. A reef, with two islets on it, extends about a quarter of a mile southward from the western entrance point, and a detached reef, part of which is above water, lies a little farther southward. The positions and extent of the shoals which extend southward and south-westward from the mouth of Rach Ong Ben can best be seen on the chart.

Rach Dong (Dong Gioc) is entered between a point about 6½ cables west-north-westward of the western entrance point of Rach Ong Ben and the southern extremity of Culao Phu Long (Kulao Ka Doi), about 4 cables north-north-westward. A bank, which dries about 4 feet (1m2), extends about 2 cables from the south-western side of Culao Phu Long, and Culao Con O (Kulao Kon O), which dries one foot (0m3), lies about 6 cables west-south-westward of the southern extremity of the latter, near the northern end of a bank, with depths of less than one fathom (1m8) over it, which extends north-north-westward from the bank extending south-westward from the mouth of Rach Ong Ben.

Song Cai Mep (Lai Lang) is entered between the southern extremity of Culao Phu Long and the south-eastern extremity of Culao Phu Loi, about 3 miles south-westward. A bank, which dries, extends about half a mile from the south-eastern side of Culao Phu Loi, and depths of less than 3 fathoms (5m5) extend about one mile farther south-eastward.

The main entrance of Rivière de Saïgon lies between the southern extremity of Culao Phu Loi and Pointe Can-Gio (*Lat. 10° 25′ N., Long. 106° 58′ E.*), about 2 miles south-south-eastward. A bank, which dries, extends about 3 cables north-eastward of Pointe Can-Gio. There are several patches, with depths of less than 4 fathoms (7m3) over them, on the bar of the river which is about 2 miles wide and lies north-eastward of Pointe Can-Gio, between the latter and the

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Chart 1016.

shoals extending south-eastward from Culao Phu Loi. The shoalest of these patches has a depth of 3¼ fathoms (5m9) over it, and lies about 1¼ miles north-north-eastward of Pointe Can-Gio. The least depth on the recommended track is 3½ fathoms (6m4), about 1½ miles eastward of the same point.

Prohibited anchorage.—In 1946, explosives were being dumped in Song Cai Mep between the parallels of 10° 28½′ N. and 10° 29½′ N., and anchoring was prohibited between these limits.

Main channel to Saïgon.—Dangers.—Buoys.—Lights.—Above the bar the bottom consists mostly of soft mud, but there are some patches of sand and coral. There is a least depth of 19 feet (5m8) in the fairway. (*See* page 224.)

Vessels 656 feet (200m0) long can proceed to Saïgon, and it is reported that vessels with local knowledge can ascend Rivière Dong-nai (page 216) to within 6 miles of Bien-Hoa (page 216).

Between Pointe Can-Gio and the mouth of Song Dong Dinh, about 2½ miles west-north-westward, a bank, which dries from one to 6 feet (0m3 to 1m8), extends nearly 4 cables offshore in places, and depths of about one fathom (1m8) extend about one cable farther and the edge of the bank is steep-to.

A mooring buoy is situated on the edge of the bank on the south-western side of the river about 1¼ miles north-westward of Pointe Can-Gio (*Lat. 10° 25′ N., Long. 106° 59′ E.*).

On the north-eastern side of the river, a bank, with depths of less than 3 fathoms (5m5) over it, extends about 4 cables from the southern end of Culao Phu Loi. Rach Tcheu (Song Kai Bap), about 3 cables wide, flows into Rivière de Saïgon between Culao Phu Loi and the south-western end of Thanh An, an island. A bank, which dries 4 feet (1m2), extends about half a mile from the southern end of this island. Pointe de Nuoc Van (de l'Entrée), the south-western extremity of Thanh An, lies about 4 miles north-westward of Pointe Can-Gio.

On the western side of the river, between the mouths of Song Dong Dinh and Song Ca (Ka) Gau, about 2¼ miles northward, the shore is fringed by a drying mudbank. A bank, with depths of less than 2 fathoms (3m7) over it, extends about 4 cables north-eastward from the northern entrance point of Song Dong Dinh, and about one cable eastward from the southern entrance point of Song Ca Gau.

A light, known as Can-Gio upper light, is exhibited, at an elevation of 57 feet (17m4), from a round tower over a dwelling built on piles, situated 5 miles north-westward of Can-Gio lower light, on the outer edge of the coastal bank which extends eastward from the northern side of the entrance to Song Dong Dinh.

Leading lights, named Bayen lights, are established on the northern side of the entrance of Song Ca Gau. The front light is exhibited, at an elevation of 28 feet (8m5), from a white pylon, about 33 feet (10m1) in height, and the rear light, at an elevation of 36 feet (11m0), from a similar structure, about 41 feet (12m5) in height, 164 yards (150m0) north-north-westward of the front light. These lights in line bear 335°.

About 4 miles northward of Pointe de Nuoc Van, Song Dong Tranh and Song Dua, about three-quarters of a mile farther westward, enter the northern side of the river. The reach where these streams enter the river is named Les Quatre Bras. Between the mouth of Song Dua

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Chart 1016.

and Pointe du Kervella, on the western side of the river, about 4 miles west-north-westward, four small streams enter the river on its southern side, and one on its northern side. A spit, with depths of less than 3 fathoms (5^{m}5) over it, extends about one cable eastward from Pointe du Kervella, and there is a depth of 17 feet (5^{m}2) about one cable offshore close northward of the point.

Rach Don enters the western side of the river about 1¼ miles north-westward of Pointe du Kervella (*Lat. 10° 33′ N., Long. 106° 51′ E.*). A bank, with a least depth of 1¾ fathoms (3^{m}2) over it, and a depth of 3 fathoms (5^{m}5) at its outer edge, extends half way across the river from the mouth of Rach Don.

Pointe de l'Est lies on the south-eastern side of a bend about 9 cables northward of the mouth of Rach Don; a spit, with a depth of 2½ fathoms (4^{m}6) over it, at its outer end, extends nearly one cable westward from Pointe de l'Est.

Haut de l'Est, a point on the north-western side of a bend, lies about 1¼ miles eastward of Pointe de l'Est. Banc du Propontis, consisting of sand, extends from the eastern side of the river from abreast this point to the southern entrance point of the Tac Dinh Cau (Rach Dinh Kau), about 6 cables northward. There is a depth of 5 fathoms (9^{m}1) on the south-western end of Banc du Propontis, about 1¼ cables off the western shore, with less depths towards the river bank eastward. The least depth over Banc du Propontis is 2½ fathoms (4^{m}6), situated near the middle, about half a cable offshore.

The mouth of Tac Dinh Cau is about 2 cables wide, with a 2-fathom (3^{m}7) patch nearly midway between the entrance points.

Pointe du Lombard lies on the western side of the river about 4 cables northward of the mouth of Tac Dinh Cau. Banc du Lombard, with a least depth of 1¾ fathoms (3^{m}2) over it, extends about half a cable eastward from Pointe du Lombard.

Chart 1016, plan of Coral bank.

The southern end of Banc de Corail (Coral bank), which extends across the river, is situated about half a mile northward of Pointe du Lombard, and its northern end, in a bend about one mile farther north-north-westward. The bank consists of hard red rock under about 3 feet (0^{m}9) of mud, through which a channel about three-quarters of a cable wide, has been dredged. The least depth in this channel is 19 feet (5^{m}8), near its southern end. The channel passes near the point on the south-western side of the bend; the north-eastern side of the bend is somewhat encumbered by the bank which extends offshore nearly half way across the river.

Two pairs of leading lights are situated near Banc de Corail. The front light of the northern pair is exhibited, at an elevation of 37 feet (11^{m}3) from a white iron pylon with a white circular daymark, about 45 feet (13^{m}7) in height, and the rear light, at an elevation of 64 feet (19^{m}5), from a similar structure, about 73 feet (22^{m}3) in height, 164 yards (150^{m}0) north-north-westward of the front light. These lights in line bear 340°, and are situated near the northern end of Banc de Corail, about 1½ miles northward of Pointe du Lombard.

The front light of the southern pair (*Lat. 10° 37′ N., Long. 106° 51′ E.*) is exhibited, at an elevation of 37 feet (11^{m}3), from a white metal pylon with a white circular daymark, about 45 feet (13^{m}7) in height, and the rear light, at an elevation of 65 feet (19^{m}8), from a

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Chart 1016, plan of Coral bank.

similar structure, about 72 feet (21m9) in height, 164 yards (150m0) east-south-eastward of the front light. These lights in line bear 120°, and are situated on the eastern bank of the river about 4½ cables south-eastward of the northern pair of leading lights.

In addition to the above there were, in 1947, two beacons a short distance westward of the northern pair of leading lights and two beacons near the southern pair; also a beacon on the south-western bank of the river at the bend. A mooring buoy is situated close eastward of the latter beacon.

The northern and western beacons were then reported to be under-painted and much overgrown, but could be distinguished on near approach.

Chart 1016.

Pointe Mongom, the eastern entrance point of the northern mouth of Song Dong Tranh (Rach Mon gom), which is about 1¾ cables wide, lies about 2¼ miles north-westward of Pointe du Lombard. A drying bank extends a short distance westward from Pointe Mongom (*Lat. 10° 38′ N., Long. 106° 50′ E.*).

Pointe du Valéro is situated on the southern side of the river about a quarter of a mile south-south-westward of Pointe Mongom. Banc du Valéro extends about 2 cables from the south-western side of the river south-eastward of Pointe du Valéro; there is a depth of 22 feet (6m7), sand, near the middle of the river, on the eastern edge of this bank, about 4½ cables south-eastward of the point.

Pointe O Ro (Oro) lies on the south-western side of the river, about 2½ miles north-westward of Pointe du Valéro. There is a coral patch, with a depth of 4½ fathoms (8m2) over it, near the middle of the river about 1½ cables northward of Pointe O Ro.

Pointe Phami (Fami) lies about 2 miles north-westward of Pointe O Ro. A spit, with a depth of 2½ fathoms (4m6) at its outer extremity, extends about 2 cables north-westward from Pointe Phami. Song Soirap (page 217) is entered on the southern side of the river between Pointe Phami and Pointe du Lazaret, about half a mile westward. There is a signal station, connected to the telegraph system, about 3 cables northward of Pointe du Lazaret. Pointe de Phuoc (Fuok) Khanh lies on the north-eastern side of the river, about a quarter of a mile north-eastward of Pointe Phami.

A light is exhibited from the signal mast situated 3 cables northward of Pointe du Lazaret.

A light is exhibited, at an elevation of 32 feet (9m8), from a white iron pylon, about 33 feet (10m1) in height, situated on Pointe de Phuok Khanh.

A shoal, with a depth of 1¾ fathoms (3m2) over it, marked by a black and green can buoy, surmounted by a cone, lies in the middle of the river about one mile north-north-westward of the light-structure northward of Pointe du Lazaret.

The reach of the river between Pointe Phami and Pointe du Feu Rouge, about 4½ miles northward, is named Nha-Bé. The port of the same name is situated close southward of the mouth of Rach No, on the western side of this reach, about 2¼ miles north-north-westward of Pointe Phami. There are some prominent oil depots at Nha-Bé, off which are some wharves and some warping buoys. The mouth of Rach Doi is situated on the western side of the river, about 3 cables

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Chart 1016.

northward of Port du Nha-Bé; there is a Custom-house on the northern side of the mouth.

A light is exhibited, at an elevation of 27 feet (8m2), from a white pylon, about 29 feet (8m8) in height, situated at the northern side of the entrance of Rach Doi.

Banc du Sud, with a depth of 3½ fathoms (6m4) over it, lies about 2½ cables east-north-eastward of the signal station at Pointe du Lazaret (*Lat. 10° 40′ N., Long. 106° 46′ E.*); another shoal, with a similar depth over it, lies in mid-river, on the recommended track, about 3½ cables north-eastward of the signal station.

A mooring buoy is situated on the western edge of the bank extending from the eastern shore, about 8 cables north-north-eastward of the light-structure situated on the northern side of the entrance to Rach Doi.

A bank, with a depth of 3 fathoms (5m5) over its outer edge, extends, about 2 cables from the north-eastern side of the river, about 1¼ miles northward of Pointe du Lazaret.

Banc de la Ville de Paris, composed of sand, mud, and rock, with a least depth of 3 feet (0m9) over its southern end, extends about half way across the river from the eastern side abreast the mouth of Rach Doi. A bank, with depths of less than 3 fathoms (5m5) over it, extends from the same side of the river, as far as the middle, from the northern end of Banc de la Ville de Paris to abreast Pointe du Feu Rouge. Banc des Mules, with a least depth of 2 fathoms (3m7) over it, lies on this bank about one mile southward of Pointe du Feu Rouge.

A shoal, with a depth of 3½ fathoms (5m9) over it, lies about 2 cables off the western side of the river, about one mile south-south-westward of Pointe du Feu Rouge.

Rivière Dong-nai (page 216) joins Rivière de Saïgon between Pointe de Binh Loi, situated about 4 cables north-north-eastward of Pointe du Feu Rouge, and a point about 8 cables south-eastward.

Banc du Caobang (Kaobang), with a least depth of one fathom (1m8) over it, extends about half a mile from the northern bank of Rivière Dong-nai, close eastward of Pointe de Binh Loi.

A black conical buoy marks the extremity of a spit, with a depth of 2½ fathoms (4m6) over it, which extends from the northern bank of Rivière Dong-nai, about 3 miles north-eastward of Pointe du Feu Rouge.

Pointe du Rach Bao lies on the northern side, about 8 cables westward of Pointe du Feu Rouge. Banc du Chargeur, with a depth of 1½ fathoms (2m7) at its outer edge, extends about half a cable from the south-western side of Pointe du Rach Bao and Banc du Gange, with a depth of 3 fathoms (5m5) over its eastern side, extends from the western bank nearly half way across the river, just above Banc du Chargeur.

The mouth of Canal de Dérivation, the southern limit of the port of Saïgon, is situated on the southern side of the river about 4 miles, by river, above Pointe du Rach Bao; it has a least depth of 10 feet (3m0).

Anchorage.—Prohibited anchorages.—Vessels can anchor anywhere in the channel of approach to Rivière de Saïgon. The best anchorage during the South-west monsoon is northward of Pointe Can-Gio, in depths of from 6½ to 7 fathoms (11m9 to 12m8).

Anchorage is prohibited, except in an emergency, within a distance

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Chart 1016.

of one mile on either side of the sharp bends of the river, or near the channel dredged through Banc de Corail.

Anchorage is prohibited between Pointe Phami (*Lat. 10° 40′ N., Long. 106° 46′ E.*) and Rach Doi.

Signals.—In order that a vessel may be distinguished on arrival off the signal station at the southern end of Nha-Bé reach, she should display her national flag, her number, and, if there is reason for so doing, the mail flag or quarantine flag. By night, she should exhibit distinguishing lights.

The reply from the signal station will be: By day, the pendant of the International Code of Signals, signifying that the vessel may proceed, or flag B of the International Code of Signals, signifying that she must anchor; at night, a *white* light signifying that the vessel may proceed, or a *red* light signifying that she must anchor.

Vessels which have not a clean bill of health and those carrying explosive material should anchor at Nha-Bé.

Passing Nha-Bé, a vessel can despatch a telephone message to Saïgon by displaying flag N of the International Code of Signals, when a boat will board the vessel and receive the written message.

Vessels requiring to make certain of the assistance of tugs will gain time by displaying the signal YP in the International Code of Signals as they pass Nha-Bé.

If the assistance of the Harbour Master is required, flag H of the International Code of Signals, accompanied by the Code pendant, should be displayed and a blast sounded on the whistle or siren at the same time.

Tidal streams.—At Cap St. Jacques the in-going stream begins to flow very shortly after low water and the out-going stream shortly after high water there. The duration of slack water is about 20 minutes.

At Saïgon the flood stream begins to flow about $4\frac{3}{4}$ hours after low water and the ebb stream about $4\frac{3}{4}$ hours after high water at Cap St. Jacques. The duration of slack water is also about 20 minutes. The in-going stream attains its maximum rate quickly, the out-going stream slowly.

The rate of flow varies between one knot and $3\frac{1}{2}$ knots and the local pilots work on a rate of flow of one knot for every 3·2 feet (1^m0) of range. According to them if the range of the flood tide is less than 3 feet (0^m9) there is no flood stream for that flood tide. Off Pointe du Lombard violent cross streams and undertows are experienced and in Tac Dinh Cau (Rach Dinh Kau), about 4 cables southward of Pointe du Lombard, and on the eastern side of Rivière de Saïgon, which is used by small craft, the stream flows at a rate of 5 knots.

Off Saïgon the tidal stream on the eastern bank turns about 20 minutes before the stream in mid-river.

The durations and rates of the tidal streams are greatly influenced by the rainy season (August and September) and the flood stream is often completely overcome, the ebb stream flowing continuously.

In the North-east monsoon a vessel may be set to leeward of Cap St. Jacques and towards Banc Can-Gio, by the prevailing current, accelerated by the flood tidal stream. During the ebb tidal stream, however, the current is at times overcome, and there may be a north-easterly set. During the rising tide the stream sets westward over

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Chart 1016.

Banc Formosa. Westward of the bank it sets more northerly into Baie de Ganh Rai. On the falling tide it sets in a southerly direction out of the bay and eastward over Banc Formosa. Slack water occurs about 1½ hours after high and low water at Cap St. Jacques, and the streams attain a rate of about 2 knots, which speed is maintained for the middle two hours of the rising and of the falling tide.

Directions.—In thick weather, the banks in the southern approach to Rivière de Saïgon should be cleared by attention to the soundings. Approaching from north-eastward, Britto bank (page 233), and other dangers lying off the coast north-eastward of Cap St. Jacques (*Lat. 10° 19′ N., Long. 107° 05′ E.*), described on page 231, should be given a wide berth.

Entering, the track usually followed is indicated by a pecked line on the chart.

For vessels with a speed of 13 knots it is advisable to arrive off Cap St. Jacques at the commencement of the flood on a day when the tidal stream will be sufficiently strong for the flood stream to be felt as far up as Saïgon, and she should proceed at a speed greater than 11 knots; the vessel will be more easily berthed at the last of the flood. If proceeding to sea, the best time to leave Saïgon is about half an hour after high water; it is, however, practicable to proceed earlier if desired.

About 80 miles from the coast, the wind in settled weather usually hauls to east-north-east and east about 1600, continuing fresh and puffy throughout the night.

In the South-west monsoon, a vessel abreast Pulau Condore (chart 2660*a*) should steer to pass along the edge of the bank fronting the delta of Le Mékong, and extending to the mouth of Rivière de Saïgon. Strong freshets run out of the rivers during this monsoon, and join the north-easterly current, whereby a vessel is obliged to keep the edge of the bank aboard to prevent being set to leeward of Cap St. Jacques. Soundings should constantly be obtained while steering along the edge of the bank, keeping in depths of not less than 10 fathoms (18^{m}3). Should the depths begin to decrease, the vessel should haul off eastward, when the depths, which are fairly regular, will soon increase.

The vessel should continue along the edge of the bank in these depths until Cap St. Jacques bears less than 020°, when course may be steered as requisite for the entrance, where a pilot must be obtained.

Chart 1016, plan of Saïgon roadstead.

Saïgon.—Saïgon is the capital of South Viet-Nam; it is situated on the western bank of Rivière de Saïgon and lies between Arroyo Chinois, about one mile north-westward of the mouth of the Canal de Dérivation (page 226), and Arroyo de l'Avalanche, about one mile northward. The business part of the city is the southern portion, known as the Port de Commerce; northward are the dock-yard and barracks and westward are the residences of the Lieutenant-Governor and the principal officials.

The statue of l'Amiral Rigault de Genouilly stands close to the river bank, about 3½ cables northward of the Arroyo Chinois. At the northern entrance of the latter are the Harbour offices, the Custom-house and a flagstaff. A ferry crosses the river about one cable below the statue (*Lat. 10° 46′ N., Long. 106° 42′ E.*).

Charts 1261, 2660a, 1263.

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Chart 1016, plan of Saïgon roadstead.

The population of the town, in 1948, was estimated to be about 695,000, including 13,000 French.

Harbour limits.—The limits of the port of Saïgon are between the mouth of Canal de Dérivation and that of Arroyo de l'Avalanche. Port de Commerce consists of that portion below a line drawn across the river from the statue, mentioned above; northward of this line is the Port de Guerre.

Depths.—The least depth in Port de Commerce is 4½ fathoms (8m2), on the Banc du Canton, nearly in the middle of the river off the mouth of Arroyo Chinois. With this exception the depths in the fairway are 6½ fathoms (11m9) or more. In Port de Guerre there is a one-fathom (1m8) patch situated about 4 cables south-westward of the southern entrance point of Arroyo de l'Avalanche and about half a cable from the western shore.

Arroyo Chinois, which connects Saïgon with Cholon, close south-westward, has a least depth of 3 feet (0m9), and has three bridges.

Mooring berths.—Prohibited anchorage.—In the portion of the harbour reserved for men-of-war there are several mooring buoys, in depths of from 5 to 7 fathoms (9m1 to 12m8).

There are several wharves, one of which named Quai de l'Yser (*Lat. 10° 46′ N., Long. 106° 43′ E.*), is 1,130 yards (1,033m3) long, with depths of from 17 to 26 feet (5m2 to 7m9) alongside, in 1946, and is situated on the south-western side of the river, close above the mouth of Canal de Dérivation. It was reported, in 1944, that vessels lying alongside this wharf in certain positions, with a falling tide, were liable to foul projections. Farther up-stream, Quai de Messageries Maritimes is about 462 yards (422m1) long, with depths of from 24 to 28 feet (7m3 to 8m5) alongside.

Vessels are, as a rule, moored head and stern between mooring buoys, bows down river, or are berthed alongside the wharves. There are several mooring berths between the mooring buoys and alongside T-headed jetties below the south-eastern limit of the harbour.

Anchorage is prohibited in the river except below the mooring berths and out of the fairway at a considerable distance from the city.

All vessels are berthed under the direction of the Captain of the port.

Vessels are only permitted to turn round in two areas, one of which is near the mouth of Arroyo Chinois, and the other above the portion of the harbour reserved for men-of-war. Vessels berthing in the Port de Commerce usually turn on their starboard anchor off Arroyo Chinois with the assistance of the flood stream and then steer down river to berth head down stream; deep-draught vessels should arrive off Arroyo Chinois with the very last of the flood stream to avoid turning too quickly, thus risking parting their cable. Vessels proceeding to the man-of-war harbour are swung round by grounding their stems on the river bank and allowing the tidal stream to swing them. Pylons indicate the positions on the eastern bank of the river where vessels can place their bows against the bank in safety.

Harbour regulations.—Vessels arriving on the same tide can only follow one another at intervals of three-quarters of an hour.

No vessels, except mail steamers, are, as a general rule, permitted to shift berth at night, between 1800 and 0600.

Permission to proceed to sea must be obtained from the Harbour Authority 6 hours in advance and in daylight hours.

Charts 1261, 2660a, 1263.

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Chart 1016, plan of Saïgon roadstead.

Trade.—Shipping.—The principal exports are rice, dried and salted fish, maize, copra, fish oil, pepper and rubber; the chief imports are coal, wines, spirits and hardware.

In 1948, 555 steam vessels of 1,490,000 tons entered the port of Saïgon.

Port facilities.—Water is laid on to Quai de l'Yser (*Lat. 10° 46′ N., Long. 106° 43′ E.*); elsewhere the supply is by water-boat.

A small quantity of coal is kept in stock. Fuel oil may be obtained at Port du Nha-Bé (page 225), where there are three oil storage installations on the right bank of the river.

Provisions are plentiful.

Repairs can be effected. There are two Government dry docks, which merchant vessels are permitted to use. For the dimensions of the larger dock, *see* Appendix I. There are several tugs.

There are two floating cranes of 16 and 50 tons lifting capacity, and there are two 15-ton cranes at the wharves.

There is a military hospital where seamen are received.

Deratisation.—Deratisation can be carried out, and Deratisation and Deratisation exemption certificates can be issued to vessels.

Consul.—British Consular officers are stationed at Saïgon.

Communication.—There is regular steamer communication with Europe, Singapore, Manila, and Hong Kong; also with the principal ports of Indo-China.

Saïgon is connected by rail northward with Hanoi and Langson; a short line connects with My-Tho. *See* also on page 6.

There is communication by air with Europe.

Saïgon is connected to the general telegraph system.

Radio station.—There is a radio station at Saïgon. *See* page 28.

Storm signals.—Storm signals are shown at Saïgon. *See* page 18.

Chart 1261.

COAST.—Between Cap St. Jacques and Cap Tiwan, about 11 miles east-north-eastward, there is a shallow bay, the shores of which are low, backed by sandhills, and fringed by a bank, which dries, extending from about one to $2\frac{1}{2}$ cables offshore, except at Cua Lap, situated about $5\frac{1}{2}$ miles westward of Cap Tiwan (*Lat. 10° 23′ N., Long. 107° 15′ E.*). Here the bank, which dries one foot (0^m3), extends about half a mile from the western entrance point, and, drying 4 feet (1^m2) at its outer end, extends about $1\frac{3}{4}$ miles south-westward from the eastern entrance point. In the fairway of the channel over the bar between these banks there is a depth of 2 feet (0^m6). The village of Cua (Kua) Lap stands on the western side of the entrance, and that of Phuoc (Fuok) Tinh on the eastern side. Baie de Ganh Rai (page 221) can be reached by boats through Cua Lap.

Cap Tiwan rises to several peaks, the highest of which, named Nui Chau Vien, situated 2 miles northward, has an elevation of 1,079 feet (328^m9).

Between Cap Tiwan and Pointe Tram, about 12 miles east-north-eastward, the eastern half of the coast is fringed by a bank with depths of less than 3 fathoms (5^m5) over it, extending about 2 miles offshore. The village of Cho Phuoc Hai (Cho Luoi Re), where there is a post and telegraph office, is situated about $3\frac{1}{2}$ miles north-eastward of Cap Tiwan. Rach Song Cai (Song Rai) discharges about

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Chart 1261.

2¾ miles north-eastward of Cho Phuoc Hai. The village of Loc (Lok) An stands on the west bank of Rach Song Cai, about three-quarters of a mile from the entrance. The village of Thuan Bien stands close westward of Pointe Tram.

Cap Ba Ké (*Lat. 10° 30′ N., Long. 107° 30′ E.*), 390 feet (118m9) high, lies about 4½ miles east-north-eastward of Pointe Tram and close to the seaward end of the boundary between South Viet-Nam and Central Viet-Nam. A chain of yellowish-white sandhills, from 120 to 150 feet (36m6 to 45m7) high, extends along this stretch of coast a short distance inland, from one to 3 miles north-eastward of Pointe Tram. Nui Ho Linh, 528 feet (160m9) high, lies about 8½ cables north-westward of Cap Ba Ké. *See* view B on chart 1261.

A shoal, with a least depth of one foot (0m3) over it, lies about 1¼ miles eastward of Pointe Tram, and one mile offshore.

Tidal streams.—At a position 1½ miles offshore eastward of Cap Tiwan the streams have a maximum rate of one knot for a tidal range of 6½ feet (2m0), setting 230° on the rising tide and 040° on the falling. The streams have their minimum rate of about a quarter of a knot about one hour after high and low water.

Off-lying dangers.—Banc Formosa and other shoals lying south-eastward of Cap St. Jacques, are described on page 218.

Roche Pernambuco, with a depth of 1¼ fathoms (2m3) over it, lies about 2 miles south-eastward of Cap Tiwan. The depths are irregular in the vicinity of Roche Pernambuco and several shoal patches lie near it, the positions of which can best be seen on the chart; the shoalest and outermost of these patches, with a depth of 2¾ fathoms (5m0) over it, lies about 3¼ miles south-eastward of Cap Tiwan.

A shoal, with a depth of 2¾ fathoms (5m0) over it, lies about 7¼ miles eastward of Cap Tiwan and 4 miles offshore; a 4½-fathom (8m2) patch lies about one mile south-westward of this shoal. Vessels are recommended to keep in depths of more than 10 fathoms (18m3) when passing Cap Tiwan.

Ba Ké shoals, a number of isolated patches, with depths of from 2¼ to 5 fathoms (4m1 to 9m1) over them, lie within about 7 miles south-south-eastward of Pointe Tram; the positions of these patches can best be seen on the chart. These dangers cause overfalls, particularly near the edge of the coastal bank; but in depths of from 10 to 12 fathoms (18m3 to 21m9), the bottom is generally soft mud and the depths regular.

Detached shoals, with depths of 5½ and 6½ fathoms (10m1 and 11m9) over them, lie about 8 and 11 miles, respectively, southward of Pointe Tram, the latter being near the edge of the 10-fathom (18m3) line.

Rosslyn rock, with a depth of 2 feet (0m6) over it, lies 6¼ miles south-south-eastward of Cap Ba Ké (*Lat. 10° 30′ N., Long. 107° 30′ E.*).

In hazy weather vessels should keep in depths of 12 fathoms (21m9) or more when passing these dangers.

Charts 2660a, 2661a.

CENTRAL VIET-NAM.—The coast of Central Viet-Nam is for the most part mountainous, and consists of a succession of jagged cliffs and wind-swept sand hills. Numerous banks of sand or rock fringe the coast. Northward of Cap Padaran (page 237) there are many bays and secure anchorages.

Chart 1263.

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Charts 2660a, 2661a.

Tidal streams.—Currents.—Off the coast the tidal streams are weak and the water flow is governed by the current. Such observations as are available suggest a north-going stream about high water and a south-going stream around low water. Tidal streams near large inlets or river mouths, inwards on the rising tide and outwards on the falling tide, are apparent.

Off the coast of Central Viet-Nam, between Cap Padaran and Cap Varella, the full force of the strongest part of the currents in both monsoons is experienced, flowing approximately parallel to the coast. During the North-east monsoon, the greatest rates recorded are from 2 to 3 knots along this part of the coast, and from 2 to 2½ knots during the South-west monsoon.

The currents off the coast of Central Viet-Nam attain their greatest rate at a distance of 3 miles. Occasionally there is an eddy current within 3 miles of the coast.

From the entrance to Rivière de Saïgon to Cap Padaran the currents in both monsoons are weak, and rarely exceed the rate of one knot.

Northward of Cap Varella, to Qui Nhon, the greatest rate experienced in the North-east monsoon is 1½ knots, and between Qui Nhon and Tourane about 2 knots.

During the South-west monsoon, there is usually little current near the coast northward of Cap Varella. It sometimes runs northward, but a southerly current from Tongking gulf appears to be more frequent, and may at times attain a rate of one-half to three-quarters of a knot. During the strength of the South-west monsoon, however, the north-east current sometimes attains rates of from 2 to 2½ knots between Culao Ré and Cap Chon May Est.

In the transition month of September, a stronger southerly current from eastward and southward of Hainan meets the coast in the neighbourhood of Culao Rai and flows thence to the vicinity of Cap Varella, while the north-easterly current of the South-west monsoon is still setting past Cap Padaran (*Lat. 11° 22′ N., Long. 109° 01′ E.*) (*see* Figure 4, page 15). In October, this southerly current persists as part of the general flow of the North-east monsoon current, which is established in that month.

During March, the southerly current of the North-east monsoon still flows along the coast of Central Viet-Nam, though it has weakened considerably. In April, the currents off this coast are in transition and are variable; in May, the north-east current of the South-west monsoon is becoming established.

Chart 1261.

Coast.—Dangers.—Light.—Between Cap Ba Ké and La Ghi, a village situated at the mouth of Song Dinh, about 18 miles northeastward, the coast is low and wooded close inland and is fringed by a narrow drying bank. Mui Tan lies about 11 miles north-eastward of Cap Ba Ké; a patch, which dries 2 feet (0m6), lies nearly half a mile south-eastward of Mui Tan. Mui Ho Lo, close off which is an islet, lies about 4½ miles east-north-eastward of Mui Tan. Between Mui Ho Lo and La Ghi, a spit, over which there is a depth of less than 6 feet (1m8) and a depth of 2 fathoms (3m7) at its extremity, extends about 4¼ miles offshore; two detached 5-fathom (9m1) patches lie about 1½ miles south-westward and south-eastward, respectively, of the extremity of this bank.

Chart 1263.

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Chart 1261.

Hon Ba, 127 feet (38m7) high, and wooded at its summit, lies about 1½ miles eastward of La Ghi village.

Pointe Deu lies about 5 miles north-eastward of La Ghi village. Tam Tan (Tam Tam) village stands near the mouth of Song Phan (Fong), situated about 1½ miles east-north-eastward of Pointe Deu; north-westward of Tam Tan there is a range of low hills. Pointe Nui Nhum lies about 7 miles eastward of Pointe Deu.

Some rocks above water lie close south-eastward of Pointe Nui Nhum and some other rocks, which dry 6 feet (1m8), lie nearly half a mile south-westward of it. The eastern end of a bank, with depths of from 2 to 3 fathoms (3m7 to 5m5) over it, lies about half a mile southward of the rocks which dry; the bank extends west-south-westward for about 3 miles. The coastal bank, over which there are depths of less than 5 fathoms (9m1), extends, in the form of a spit, nearly 3 miles southward from the western end of this bank.

Between Pointe Nui Nhum and Pointe Ké Ga, about 1¾ miles eastward, there is a shallow bight.

Pointe Ké Ga is the extremity of a tongue of low land, the prolongation of a spur from Nui Ta Kou (*see* below). Îlot Ké Ga lies close southward of the point.

A light is exhibited, at an elevation of 213 feet (64m9), from an octagonal granite tower, about 135 feet (41m1) in height, on Îlot Ké Ga. In 1946, this light was extinguished.

Inland of the coast westward of Pointe Ké Ga the country is mountainous; Nui Bé, 2,844 feet (866m8) high, lies 16 miles north-north-eastward of Cap Ba Ké and 8½ miles inland; Nui Khong, 1,919 feet (584m9) high, lies about 15 miles west-north-westward of Pointe Ké Ga, and Nui Ta Kou, 2,273 feet (692m8) high, lies about 9 miles north-westward of the same point. Nui Ta Kou is the most conspicuous of these mountains and stands detached from any other high land.

Off-lying danger.—Britto bank lies about 19 miles eastward of Cap Ba Ké, near the outer edge of the 10-fathom (18m3) line, about 10 miles offshore. On the western side of the bank is a rock, with a depth of less than 6 feet (1m8) over it. Vessels are recommended not to pass between Britto bank and the coast without local knowledge, and, in thick weather, should not approach the bank in depths of less than 16 fathoms (29m3).

Anchorage.—Vessels may obtain anchorage, in a depth of 7 fathoms (12m8), sand, during the South-west monsoon, with Pointe Ké Ga (*Lat. 10° 42′ N., Long. 107° 59′ E.*) bearing 208°, distant 7 cables.

Outlying islands and banks.—Pulau Cecir de Mer, the islands and dangers southward of it, Holland bank, and Marne bank, which lie a considerable distance from the portion of the coast described above, have been described on pages 112-113.

Madge bank, with a least depth of 7 fathoms (12m8) over it, coral, lies about 19 miles eastward of Pointe Ké Ga.

Rivier bank, with a depth of 7 fathoms (12m8) over it, coral, lies about 32 miles eastward of Pointe Ké Ga.

Torcy bank, with a least depth of 7 fathoms (12m8) over it, lies about 12 miles north-eastward of Rivier bank and 15 miles offshore.

Coast.—Light.—Dangers.—Baie de Phan (Fan) Thiet is entered between Pointe Ké Ga and Pointe Vinay, about 22 miles north-eastward. The depths in the bay are irregular; rocks, some of which

Charts 2660a, 1263.

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Chart 1261.

are above water, lie about three-quarters of a mile south-westward of Phan Thiet light-structure, and there is a detached shoal, with a depth of 1½ fathoms (2m7) over it, about 1¼ miles farther south-westward and about 6 cables offshore. The north-eastern part of the bay is shallow, and a bank, with depths of less than 3 fathoms (5m5) over it, extends 1½ miles westward from Pointe Vinay. A shoal, with a depth of 5¼ fathoms (9m6) over it, lies about 4½ miles south-westward of Pointe Vinay. Fishing nets may be found at a distance of 10 miles offshore abreast Baie de Phan Thiet and Pointe Vinay.

The town of Phan (Fan) Thiet is situated about midway between the entrance points of the bay of that name, at the mouth of Song Ca Ti, and the village of Thien Khanh is situated in the north-eastern part of the bay, about 1½ miles northward of Pointe Vinay.

The entrance to Song Ca Ti is fronted by a sandbank, which dries, leaving only a narrow channel, on which the sea nearly always breaks.

A light is exhibited, at an elevation of 40 feet (12m2), from a white pylon, about 33 feet (10m1) in height, on the eastern side of the entrance to Song Ca Ti, near the Custom house. In 1949, it was reported that the light-structure was obscured by trees.

A water tower with a red roof stands on the northern side of the river, nearly one mile north-north-westward of the light-structure.

Pointe Vinay is the extremity of a low, wooded hill, steep on its southern side, which is the southern end of a peninsula projecting nearly 3 miles. The point is steep-to on its eastern side. A tower stands on the western side of the peninsula, about one mile northward of the point.

Île Tigre or Hon Lao, 81 feet (24m7) high and covered with grass, lies eastward of Pointe Vinay, separated from it by a channel, nearly half a mile wide, in the fairway of which are depths of from 2¾ to 4½ fathoms (5m0 to 6m4).

Anchorages.—Anchorage may be obtained in Baie de Phan Thiet with the light-structure bearing 314°, distant 2 miles, in a depth of 26 feet (7m9), mud.

Landing can be effected on a small beach westward of the Custom house.

During the North-east monsoon there is anchorage westward of Pointe Vinay, off Thien Khanh, in a depth of 3½ fathoms (6m4).

During the South-west monsoon there is anchorage off a fishing village in the bay north-north-eastward of Pointe Vinay, in depths of from 2¾ to 5 fathoms (5m0 to 9m1), but the anchorage is not secure.

Phan Thiet.—The town of Phan Thiet is connected to the railway and telegraph systems. It is an important fishing centre.

Provisions are plentiful. In 1947, the population was about 10,000.

Coast.—Between Pointe Vinay (*Lat. 10° 55′ N., Long. 108° 17′ E.*) and Hon Rom, 406 feet (123m7) high, about 3½ miles north-eastward, there is a bay; thence to Pointe Guio, about 10 miles farther north-eastward, the coast is indented by two bays, separated by a point, 432 feet (131m7) high. Mont Guio, a sandhill, 770 feet (234m7) high, lies about one mile north-westward of this point, and may easily be identified. *See* view facing page 237.

Tidal streams.—Between Pointe Ké Ga and Pointe Lagan, about 15½ miles north-eastward of Pointe Guio, the tidal streams are very

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Chart 1261.

weak, setting north-eastward on a falling tide and *vice versa*, parallel with the coast.

Coast.—Dangers.—Baie de Phan (Fan) Ri is entered between Pointe Guio and Pointe Lagan. The shore is fringed by a bank, with depths of less than 3 fathoms (5m5) over it, extending about half a mile offshore, increasing to one mile off Phan (Fan) Ri village, at the mouth of Song Luy, 9 miles north-north-eastward of Pointe Guio.

There is a depth of 3 feet (0m9) over the bar of Song Luy and it is only accessible to small craft with local knowledge. Phan Ri is a large fishing village and fishing boats are sometimes met with at a considerable distance seaward of it.

Between Pointe Guio and Phan Ri the coast consists of cliffs of a reddish colour; eastward of Phan Ri it is sloping and wooded. A rocky point, 81 feet (24m7) high, on the eastern side of which is the village of Ha Thuy, projects a short distance from the northern shore of the bay, about 3 miles eastward of Phan Ri; junks anchor off this point during the North-east monsoon.

Charts 3883, 1261.

Pointe Lagan is a narrow neck of land; a fishing village of the same name is situated on the eastern side of Baie de Phan Ri about one mile northward of the point. A spit, with depths of less than 3 fathoms (5m5) over it, extends about one mile westward and 2½ miles south-westward from Pointe Lagan. Two detached shoals, with depths of 3¾ and 4¾ fathoms (6m9 and 8m7) over them, lie about 5½ and 6½ miles, respectively, south-westward of the same point.

Anchorages.—Anchorage may be obtained, in depths of from 3¾ to 5 fathoms (6m9 to 9m1), south-westward of the mouth of Song Luy, with Pointe Lagan bearing 075°.

During the North-east monsoon, small vessels with local knowledge will find good anchorage off Lagan village, in a depth of 3½ fathoms (6m4). During the South-west monsoon, vessels with local knowledge can anchor north-eastward of Pointe Lagan, in depths of from 5 to 6 fathoms (9m1 to 11m0), but this anchorage is insecure.

Off-lying dangers.—Buoy.—South-eastward of Pointe Lagan the coastal bank, with a depth of less than 10 fathoms (18m3) over it, sand and coral, extends 13 miles offshore, and on it are several dangerous shoal heads.

Banc de l'Althea, with a depth of 7 fathoms (12m8) over it, is the outermost of these shoal heads and lies about 12 miles south-south-eastward of Pointe Lagan.

Banc Bourayne, with a depth of 4¾ fathoms (8m7) over it, lies about 2½ miles north-north-westward of Banc de l'Althea.

Chart 3883.

Banc Duchaffaut, with a depth of 29 feet (8m8) over it, lies about 3 miles north-westward of Banc Bourayne. Banc Amazone, with a depth of 24 feet (7m3) over it, lies about 2 miles north-eastward of Banc Duchaffaut.

Banc de l'Octant (*Lat. 11° 06′ N., Long. 108° 50′ E.*), with a depth of 36 feet (11m0) over it, lies about 9 miles east-south-eastward of Pointe Lagan. The north-eastern end of Banc des Pêcheurs, over which there is a least depth of 23 feet (7m0), lies about 5 miles east-south-eastward of Pointe Lagan. Banc Vulcan, with a least depth of 18 feet (5m5) over it, lies about 1¾ miles southward of Pointe Lagan.

Charts 2660a, 1263.

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Chart 3883.

All the above named banks are rocky and as there are bamboo fish traps on or near them, sometimes in considerable depths, vessels should give Pointe Lagan a berth of about 15 miles.

A conical buoy is moored about 4½ miles southward of Pointe Lagan.

Coast.—Dangers.—Baie de Padaran is entered between Pointe Lagan and Mui Sung Tran, about 15½ miles north-eastward. Cap Padaran or Mui Dinh lies about 7 miles farther north-eastward. Long Huong and Vinh Hao, villages, are situated on the western side of Baie de Padaran, about 4 and 8½ miles, respectively, north-north-eastward of Pointe Lagan ; between these villages a bank, with depths of less than 5 fathoms (9m1) over it, extends about 5 miles offshore. Pulau Cécir de Terre lies on the eastern end of this bank ; at the north-eastern edge there are depths of 19 and 22 feet (5m8 and 6m7).

Between Vinh Hao and Ca Na, a village situated on the eastern side of a narrow entrance to a lake, about 7 miles east-north-eastward, the coast is fringed by reefs in places, and a bank, with depths of less than 3 fathoms (5m5) over it, extends about 6 cables offshore. Two rocks, above water, the inner of which is 13 feet (4m0) high, lie about 4 cables west-south-westward of Ca Na. Between Ca Na and Mui Sung Tran the coast is fringed by a coral reef which extends about 1½ cables offshore, beyond which the depths increase suddenly. Les Barillets, two rocky heads, which dry 6 feet (1m8) and which only break during bad weather at high water, lie about 2 miles north-westward of Mui Sung Tran and half a mile offshore.

On the northern side of Mui Sung Tran there is a small T-headed pier, with a depth of 10 feet (3m0) at its head ; a conical buoy is moored close westward of the pier-head. A rock, 2 feet (0m6) high, lies off the small point of land immediately southward of the pier.

A sandbank extends about 3 cables west-south-westward from Mui Sung Tran (*Lat. 11° 18′ N., Long. 108° 55′ E.*).

Off-lying island and dangers.—Pulau Cécir de Terre, 85 feet (25m9) high, lies about 8 miles north-eastward of Pointe Lagan. The island is mostly rocky and barren, but there is some grass on the flat parts. Rocks, both above and below water, surround the island, and a bank, with a depth of 14 feet (4m3) over it at its outer end, extends nearly one mile from its western side.

Banc Ernest Simons, with a depth of 29 feet (8m8) over it, lies about 1¾ miles eastward of Pulau Cecir de Terre ; there is a depth of 32 feet (9m8) about 1¾ miles south-eastward of this bank.

Banc de Breda, with a depth of 5 feet (1m5) over it, coral, lies nearly midway between Pulau Cecir de Terre and Mui Sung Tran. Between Banc Ernest Simons and Banc de Breda there are depths of less than 5 fathoms (9m1).

A submerged obstruction lies about one mile west-north-westward of the shoalest spot on Banc de Breda.

Anchorage.—In Baie de Padaran, during the North-east monsoon, anchorage may be obtained southward of Ca Na, in a position about 1½ miles west-north-westward of Mui Sung Tran and three-quarters of a mile offshore, in depths of from 5 to 7 fathoms (9m1 to 12m8), sand. A south-easterly swell is felt in the bay during the North-east monsoon.

Coast.—The coast between Pointe Lagan and Cap Padaran is backed by mountains, attaining an elevation of 2,942 feet (896m7) about 3½ miles north-westward of Ca Na ; the latter is situated at the

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To face page 237.

Pointe Ké Ga. *Île Tigre.* *Mont Guio, bearing about 340°, distant 12 miles.* *Pointe Guio.*

Coast between Pointe Ké Ga and Pointe Guio.

(*Original dated* 1865.)

Nui Dao.

Cap Padaran, bearing 288°, distant about 9 miles. *Nui Cha Bang.* *Mavick.* *Nui Ca Du.* *Nui Quit.* *Mui Da-Vaïch, bearing 010°*

Coast between Cap Padaran and Mui Da-Vaïch.

(*Original dated* 1930.)

Hon Chong. *Nui Vung Gang.* *Mui Da-Vaïch.* *Baie de Cam-Ranh.* *Île Tagne.*

Coast from 13 miles south-eastward of Mui Da-Vaïch.

(*Original dated* 1865.)

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Chart 3883.

southern end of a gap between the mountains which is only prominent from south-westward.

Cap Padaran (*Lat. 11° 22′ N., Long. 109° 01′ E.*) is steep and convex to seaward; high land extends south-westward from the cape as far as Mui Sung Tran. Nui Deo Cat, 2,047 feet (623m9) high, lies about 4 miles westward of Cap Padaran and 2 miles inland, and Nui Da Bac, 2,115 feet (644m6) high, lies on the eastern side of the above mentioned gap about 3 miles north-westward of Nui Deo Cat. The land near Cap Padaran appears isolated when approached from south-westward or northward. *See* view facing this page.

Light.—A light is exhibited, at an elevation of 610 feet (185m9), from a white tower with square base, about 33 feet (10m1) in height, on Cap Padaran.

Signal station.—Storm signals.—There is a signal station on the cape with which vessels can communicate by means of the International Code of Signals. Storm signals are displayed at Cap Padaran. *See* page 18.

Coast.—Dangers.—Rocks, above and below water, extend about 1½ cables from the north-eastern side of Cap Padaran. Bancs du Lutin, three shoal heads, the northern one of which has a least depth of 4 feet (1m2) over it, lie from half a mile to three-quarters of a mile northward of Cap Padaran and about 3 cables offshore. Basse Nouvelle, with a depth of 3¼ fathoms (5m9) over it, lies about 2 miles northward of Cap Padaran and one mile offshore. Abreast Basse Nouvelle a bank, on which are some drying rocks, extends over half a mile offshore.

Son Hai, a village, stands on the northern side of the mouth of a river, about 3 miles northward of Cap Padaran. Between Son Hai and a point about 4½ miles northward the coast is fringed by a coral bank, which extends a quarter of a mile offshore in places at its southern end. Between the latter point and the mouth of Song Kinh Dinh, about 3 miles northward, the coast is fringed by a narrow bank of sand.

Nui Cha Bang, 1,410 feet (429m8) high, lies 4½ miles inland at the northern end of a range of mountains which extends about 5 miles northward from Nui Da Bac; Maviek, a mountain, 1,092 feet (332m8) high, lies about 3½ miles eastward of Nui Cha Bang and about 1¼ miles inland.

Anchorage.—There is anchorage for large vessels during the South-west monsoon, off a small bay close northward of Cap Padaran, with the north-eastern extremity of the cape bearing 157°, in a depth of about 8 fathoms (14m6). The bottom is foul nearer the coast.

H.M.S. *Kent*, in February, 1933, reported having experienced no current off Cap Padaran and a south-going current, running at a rate of a quarter of a knot, between Cap Padaran (*Lat. 11° 22′ N., Long. 109° 01′ E.*), and Hon Lon, 52 miles north-north-eastward.

Baie de Phan Rang.—Dangers.—Light.—Baie de Phan Rang is entered between the mouth of Song Kinh Dinh and Hon Do, a peninsula, about 6 miles east-north-eastward. The mouth of Song Kinh Dinh is fronted by a coral ledge about 2 cables wide, which dries 2 feet (0m6) in places. The river is not navigable; Phan Rang, a town, in which there is a prominent church, lies about 3 miles north-westward of the mouth.

From a point situated about three-quarters of a mile northward of the mouth of Song Kinh Dinh, a coral bank, which dries, extends

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Chart 3883.

half a mile east-north-eastward and a bank, with depths of less than 3 fathoms (5m5) over it, extends nearly half a mile farther eastward; these dangers are covered by a *red* sector of Khanh Hoi light between the bearings of 006° and 087°. Some villages stand a short distance inland from this point and there is a prominent church with a square red brick tower about half a mile westward of the point. Ninh Chu, a town standing on the western entrance point of a river, about 3¼ miles northward of the mouth of Song Kinh Dinh, is connected to the general telegraph system; this river leads to Lagune de Naï, about 1½ miles north-north-westward of Ninh Chu. There is a jetty at Ninh Chu. Fresh provisions can be obtained.

A light is exhibited, at an elevation of 243 feet (74m1), from a dwelling, about 17 feet (5m2) in height, at Khanh Hoi, on the eastern side of the entrance to the river, about 3 cables eastward of Ninh Chu. The light was extinguished in 1948.

A bank, which dries 3 feet (0m9), extends half a mile southward from the point on which Ninh Chu stands, and two patches, with depths of 2¼ and 2½ fathoms (4m1 and 4m6) over them, lie about 2¼ and 6½ cables, respectively, south-westward of the southern extremity of this bank. A bank, which dries 2 feet (0m6), extends about 3 cables south-westward from the eastern entrance point of the river. The narrow shallow channel between these drying banks is obstructed by a detached bank, which dries, lying close southward of them.

The village of Khanh Hoi stands on the eastern side of this river about a quarter of a mile northward of the eastern entrance point. Between the mouth of the river and Hon Do, the coast is fringed by a narrow drying bank, mostly composed of coral.

Hon Do is a low peninsula joined to the mainland by a narrow neck of land; on the western side of the peninsula, the coastal bank, which dries, extends a quarter of a mile offshore and is composed of sand.

Bancs du Chateaurenault, with a least depth of 6 feet (1m8) over them, lie at the western extremity of a bank, with depths of less than 5 fathoms (9m1) over it, which extends about 3¾ miles west-south-westward from Hon Do. A shoal, with a depth of 3 fathoms (5m5) over it, lies about one mile north-eastward of Banc du Chateaurenault. Plateau de Corail, with a least depth of one foot (0m3) over it, extends from three-quarters of a mile to 1½ miles south-westward from Hon Do, and a spit, with a depth of 16 feet (4m9) over it, extends about 3 cables south-westward from Hon Do. Banc du Haïphong, with a depth of one foot (0m3) over it, coral, lies 3¼ miles west-north-westward of Hon Do, and about half a mile offshore. These dangers are covered by a *red* sector of Khanh Hoi light between the bearings of 267° and 348°.

Two mountains lie at the head of Baie de Phan Rang: Nui Ca Du, 1,039 feet (316m7) high, lies about 8 miles north-westward of Hon Do (*Lat. 11° 34′ N., Long. 109° 07′ E.*), and Nui Quit, 1,098 feet (334m7) high, lies about 3¼ miles east-south-eastward of Nui Ca Du.

Da Tram, a hill 297 feet (90m5) high, lies about one mile westward of the entrance to the river leading to Lagune de Naï.

Nui Dao and La Table, 4,756 feet (1,449m6) high, about half a mile apart, lie 11½ miles north-north-westward of Nui Quit. *See* view facing page 237.

Anchorages.—Vessels can anchor northward of the mouth of Song Kinh Dinh, in a depth of about 4 fathoms (7m3).

Charts 1261, 1342, 2660a, 2661a, 1263.

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Chart 3883.

During the North-east monsoon, good anchorage can be obtained by vessels with local knowledge in Baie de Phan Rang, in a depth of 3¾ fathoms (6m9), good holding ground, or south-south-westward of Ninh Chu, in a similar depth, clear of the shoal patches, mentioned on page 238.

Storm signals.—Storm signals are displayed at Ninh Chu, but are unreliable. *See* page 18.

Directions.—Vessels proceeding to Baie de Phan Rang, after having cleared the dangers which border the coast northward of Cap Padaran, should steer for Khanh Hoi light-structure, bearing 008°, until the summits of Nui Ca Du and Da Tram are in line, bearing 320°, which leads towards the anchorage off Ninh Chu.

Coast.—Dangers.—A rock, above water, lies close north-eastward of Hon Do. Between Hon Do and a point about 1¼ miles north-north-eastward, there is a bight, the shore of which is fringed by a bank, which dries 2 feet (0m6), extending out about 2 cables. Temporary anchorage may be obtained by vessels with local knowledge in this bight.

Hon Chong, 166 feet (50m6) high, is the outermost of a group of islands which lies about a quarter of a mile eastward of the north-eastern entrance point of the above mentioned bight. The group is joined to the mainland by a bank which dries.

Between Hon Chong and the southern entrance point of Baie de Vung Gang, about 8½ miles north-north-eastward, the coast slopes steeply from the mountains inland, and is fringed with coral reefs; landing is impracticable. Bai Lua, an islet, 84 feet (25m6) high, lies close offshore about 4½ miles north-north-eastward of Hon Chong, and a rock, with a depth of 1½ fathoms (2m7) over it, lies about 1¾ miles farther north-north-eastward and about half a mile offshore; about 1¼ miles northward of this rock and nearly half a mile offshore, there is a depth of 5 fathoms (9m1). On nearing Baie de Vung Gang the coast becomes steep-to and the depths are considerable at a distance of a few cables offshore.

Chart 3028, plan of Kam-Ranh bay and approaches.

Baie de Vung Gang.—Dangers.—The northern entrance point of Baie de Vung Gang lies about half a mile north-north-eastward of its southern entrance point; the bay is difficult to distinguish on account of the high mountains near it. There is a rock above water close eastward of the southern entrance point (chart 1261). La Sentinelle (*Lat. 11° 43′ N., Long. 109° 12′ E.*) lies close off the western shore of the bay, about 3½ cables north-north-westward of the southern entrance point; two rocks 8 feet (2m4) high and another, which dries one foot (0m3), lie about half a cable northward of La Sentinelle. Northward of these rocks the bay is divided into two basins, the outer of which affords good protection at all times and is easy of access. Heavy squalls occur at times, but the holding ground is good. The entrance to the inner basin, about one cable wide, is situated about 4 cables northward of La Sentinelle; some rocks lie close off Pointe Tortue, the south-western entrance point of this basin. The head of the bay is shallow and a drying bank extends about one cable from the south-western side of the inner basin. About 2 cables north-westward of Pointe Tortue is the mouth of a river, with Vinh (Hi), a village on its southern side, and a tower westward of the village. In 1949, there

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Chart 3028, plan of Kam-Ranh bay and approaches.

was an obstruction in the mouth of the river. A fishing village stands on the north-western side of the head of the bay. A number of fishing craft are to be found here at times in the fine season.

In Baie de Vung Gang a vessel can anchor with La Sentinelle in line with the westernmost of the above-water rocks which lie half a cable northward of it, but should not bring the rocks off Pointe Tortue to bear less than 306°.

APPROACHES TO BAIE DE CAM-RANH.—Coast.—Dangers.—Light.—Mui Da-Vaïch (Vaish), or Faux Cap Varella, lies about 1¾ miles east-north-eastward of the northern entrance point of Baie de Vung Gang; Îlot Varella, or Da Tai, 267 feet (81m4) high, lies close offshore midway between the two points.

Mui Da-Vaïch rises steeply to an elevation of 1,376 feet (419m4) about 2½ miles north-westward, and forms the eastern extremity of a range of mountains, which attains an elevation of 3,121 feet (951m3) in Nui Vung Gang, about 4¾ miles west-north-westward of the point. On Nui Vung Gang is an isolated rock, or knob, resembling that on Cap Varella (page 261). Nui Chua (Shua), 2,482 feet (756m5) and cone-shaped, lies about one mile eastward of Nui Vung Gang (*see* view facing page 237). Nui Nuoc (Nuok)-Nhi, 2,383 feet (726m3) high, lies about 1¾ miles north-north-westward of Nui Chua. Mui Da-Vaïch slopes regularly from the summit and is wooded to the steep cliffs which front the sea. Rocher Varella, 17 feet (5m2) high, and prominent, lies close southward of Mui Da-Vaïch, and there is a depth of 17 fathoms (31m1) within half a cable of the point.

Baie de Cam (Kam)-Ranh is approached between Mui Da-Vaïch and Pointe de Cam (Kam)-Ranh, about 9½ miles north-north-eastward. The bay is one of the finest harbours on the coast of Central Viet-Nam; it is available for all classes of vessels and offers secure anchorage at all times of the year both in its approaches and within the bay itself. *See* page 245 and view facing page 237.

On the south-western side of the approach, from a point about 1¼ miles northward of Mui Da-Vaïch, the coast is indented by two small bays, divided by a narrow neck of land; the entrance of the south-eastern bay is a quarter of a mile wide, and that of the north-western bay, three-quarters of a mile. A bank, with a depth of 27 feet (8m2) at its outer end, extends about half a mile northward from the southern side of the latter bay.

Hon Chut (Shut), 382 feet (116m4) high, bare and rocky, lies about 2¾ miles north-north-westward of Mui Da-Vaïch (*Lat. 11° 44′ N., Long. 109° 14′ E.*); it is connected to the mainland a short distance north-westward of the bays mentioned above by a sunken ridge. The passage over the ridge is about a quarter of a mile wide, with a depth of 2 fathoms (3m7) in the fairway. A rock, awash, lies close offshore on the western side of the southern entrance of this passage. On the eastern side of the passage, an islet, 76 feet (23m2) high, with two rocks above water close eastward of it, lies close south-south-eastward of Hon Chut, with drying coral reefs between them. A rocky patch, with a depth of 5 fathoms (9m1) over it, lies about 2½ cables north-eastward of the north-eastern extremity of Hon Chut, with foul ground between it and the island.

A light is exhibited, at an elevation of 192 feet (58m5), from a grey

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Chart 3028, plan of Kam-Ranh bay and approaches.

masonry tower, about 19 feet (5m8) in height, near the north-eastern extremity of Hon Chut.

Îlot Salacco, 77 feet (23m5) high, and rocky, lies 3½ cables north-westward of Hon Chut; a rocky ledge, with a depth of one foot (0m3) over it, extends about one cable south-eastward from the southern extremity of the islet. Basse Salacco, with a depth of 15 feet (4m6) over it, coral, lies 4½ cables north-north-eastward of the islet. A 29-foot (8m8) rocky patch lies 4½ cables south-westward of Îlot Salacco.

Hon-Ty (Ti), with a depth of 4 feet (1m2) over it, lies about 6½ cables westward of Îlot Salacco and 3 cables from the mainland; a spit, with a depth of 10 feet (3m0) at its outer end, extends one cable southward from Hon-Ty.

Between a point on the mainland about half a mile westward of Hon-Ty and Pointe Ba-Tien, about 1¼ miles north-north-eastward, the coast is fringed by a narrow drying bank. Off this stretch of coast is Mouillage de Hon Chut (Shut).

Pointe Ba-Tien is the extremity of a peninsula joined to the mainland by a narrow neck of land.

Hon Trung, 129 feet (39m3) high, composed of dark rock with its summit covered with brushwood, lies half a mile north-eastward of Pointe Ba-Tien. Rocks extend a short distance from its north-western side and also from its south-eastern extremity.

The north-eastern side of the approach to Baie de Cam-Ranh is formed by the mountainous end of a peninsula of which Pointe de Cam-Ranh is the eastern extremity. Nui Thanh-Xuong, the summit of this peninsula, is 1,517 feet (462m4) high and lies 2¼ miles west-north-westward of Pointe de Cam-Ranh. Between the latter and a point about 1¼ miles south-south-westward, the coast is cliffy. Some islets lie close off the last mentioned point, of which Hon Den, the outermost, is 47 feet (14m3) high; it is situated on the north-eastern side of a rocky shoal, with depths of 14 feet (4m3) over it, which extends one cable westward and 1½ cables southward from it. A rock, awash, lies about one cable northward of Hon Den.

Between Hon Den and a point on the mainland, about 1½ miles west-south-westward, there is a bight, at the head of which is a sandy beach. Île Tagne lies southward of the last mentioned point, which is the southern extremity of a small peninsula, 329 feet (100m3) high, separated from it by Petite Passe, about one cable wide, which leads into Baie de Binh-Ba. There are rocks, with depths of less than 6 feet (1m8) over them, on both sides of the pass, and the channel should only be used by vessels with local knowledge.

Île Tagne, the coast of which is indented, is divided into two portions by low land with palms on it; the summit, 680 feet (207m3) high, on which there is a prominent white square building, is situated on the south-western side of the island. The coast of the island is composed of large boulders, some of which lie close offshore. The head of a bight on its eastern side is fringed by a drying coral reef, over one cable wide, and rocks which dry, lie between the entrance points of the bight.

An islet, with a rock awash, about one cable north-eastward of it, lies close off the south-eastern extremity of Île Tagne, and Hon Nha (*Lat. 11° 50′ N., Long. 109° 15′ E.*), 44 feet (13m4) high, lies about a

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Chart 3028, plan of Kam-Ranh bay and approaches.

quarter of a mile eastward of this islet. Pointe Pay-Nom, the southern extremity of Île Tagne, lies nearly one mile west-south-westward of its south-eastern extremity. There is a bight between these two points, outside the entrance of which is a rocky shoal, with a depth of 29 feet (8m8) over it, situated about half a mile east-south-eastward of Pointe Pay-Nom.

Grande Passe is entered between Pointe Pay-Nom and Pointe Ba-Tien, 2½ miles west-south-westward.

Nha-Cu (Nha-Ku), an islet, lies close off the western side of Île Tagne, about one mile north-westward of Pointe Pay-Nom. Mui Nam, the north-western extremity of Île Tagne, lies about three-quarters of a mile northward of Nha-Cu. A bank, with depths of less than 5 fathoms (9m1) over it, extends about one cable northward from Mui Nam. There is a rock, with a depth of less than one foot (0m3) over it, close offshore, about 2 cables southward of Mui Nam. The northern side of Île Tagne is described below.

On the western side of Grande Passe, about 1¼ miles north-north-westward of Pointe Ba-Tien, is Pointe Bai-Tun. Roche Bai-Tun, nearly awash, lies 3 cables north-eastward of Pointe Bai-Tun, with a 3-fathom (5m5) patch between them.

Between Pointe Bai-Tun and Mui Sopt, about 2¾ miles northward, there are two bights, separated from one another by a small peninsula which is joined to the mainland by a narrow neck of land. Rocks, above water, lie on the bank fringing the coast of these bights, which extends 2 cables offshore in the southern bight and nearly one cable from the peninsula separating the bights.

Lo-Hongia, a group of rocks, one of which is 18 feet (5m5) high, lies 1¾ miles northward of Pointe Bai-Tun and near the outer end of the coastal bank, with depths of less than 5 fathoms (9m1) over it, which extends 6 cables offshore ; a rock, which dries 5 feet (1m5), lies close south-eastward of Lo-Hongia, on the outer end of the bank. A shoal, with a depth of 15 feet (4m6) over it, lies about 6½ cables north-north-eastward of Lo-Hongia and about 1½ cables offshore.

Mui Sopt is the northern extremity of the range of mountains of which Mui Da-Vaïch is the eastern extremity (*see* page 240). Rocher Doigt, a hill, 457 feet (139m3) high, lies about 4½ cables southward of the point.

The coastal bank, with depths of less than 6 feet (1m8) over it, extends nearly one cable northward from Mui Sopt.

Baie de Binh-Ba.—Dangers.—Light.—Buoy.—Baie de Binh-Ba is entered between Mui Nam and Mui Hon-Lan, lying about 2 miles north-westward. The southern side of the bay is formed by a bight in the northern coast of Île Tagne between Mui Nam and the north-eastern extremity of the island, about 1¼ miles eastward. Rocks, both above water and sunken, lie close off the shores of this bight, and the head of it is shallow. A rock, 22 feet (6m7) high, lies about one mile south-eastward of Mui Nam (*Lat. 11° 51′ N., Long. 109° 13′ E.*) and about 1½ cables offshore, and a rock, with a depth of 5 feet (1m5) over it, lies about 3 cables eastward of the 22-foot (6m7) high rock, and 1½ cables offshore. On the eastern side of the bight, there is a rock, with a depth of less than one foot (0m3) over it, about 3 cables southward of the eastern entrance point and nearly one cable offshore. A jetty extends north-westward from the eastern side of

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Chart 3028, plan of Kam-Ranh bay and approaches.

the bight, close northward of this rock, and a conical buoy is moored close off the jetty. Binh-Ba village stands at the head of the bight.

A rock, above water, lies close north-westward of the north-eastern extremity of Île Tagne, and a bank, with depths of from 5 to 15 feet (1m5 to 4m6) over it, extends about 1¾ cables northward and north-westward from the same point; on the western edge of this bank there is a coral patch, with a depth of 9 feet (2m7) over it.

The north-eastern side of Baie de Binh-Ba lies between the northern entrance point of Petite Passe (page 241) and Mui Hon-Lan. A rock, above water, with a rock, which dries less than one foot (0m3), close south-eastward of it, lies about a quarter of a mile north-westward of the northern entrance point of Petite Passe and about one cable offshore. Hon Xa, 178 feet (54m2) high, connected to the mainland by a bank about half a cable wide, which dries 6 feet (1m8), lies about 2¼ miles east-south-eastward of Mui Hon-Lan. Another islet, 49 feet (14m9) high, lies 2 cables north-westward of Hon Xa and about half a cable offshore. Pointe Bai-Choi (Bai Shoi) projects a short distance from the coast nearly midway between the latter islet and Mui Hon-Lan. A drying bank extends a short distance offshore north-north-westward of Pointe Bai-Choi. The coastal bank, with depths of less than 6 feet (1m8) over it, extends about half a cable from the south-eastern side of Mui Hon-Lan.

A light is exhibited, at an elevation of 251 feet (76m5), from a white tower, about 22 feet (6m7) in height, on Mui Hon-Lan.

For prohibited area, *see* page 245.

Le Goulet, the passage which leads into Baie de Cam-Ranh, lies between Mui Hon-Lan and Mui Sopt. The channel is about three-quarters of a mile wide and there is a depth of 12 fathoms (21m9) in the fairway.

BAIE DE CAM-RANH. — Dangers. — Lights. — Beacons. — The south-western part of Baie de Cam-Ranh lies between Mui Sopt and Pointe de Nui-Dat, about 3¾ miles westward.

Pointe Ba-Non lies 2 miles south-westward of Mui Sopt. Rocher Muc-Nuoc (Muk-Nuok), which dries 4 feet (1m2), lies about 1½ miles south-south-westward of Pointe Ba-Non and 3 cables offshore. Several streams discharge into the south-western head of the bay. Between the mouth of Rivière de l'Aiguade, the easternmost of these streams and Pointe de Nui-Dat, a bank, which dries about 2 feet (0m6), extends as much as 8 cables from the south-western side of the bay. Îlot Ba-Ninh lies on the eastern side of this bank about 1¾ miles southward of Pointe de Nui-Dat; a bank, with depths of less than 6 feet (1m8) over it, extends about 3 cables north-eastward from Ba-Ninh, and there are some shoal heads, with depths of less than 4 feet (1m2) over them, nearly half a mile east-south-eastward of the islet; a rock, with a depth of 2 feet (0m6) over it, lies 5 cables south-eastward of the islet. Between the shore westward of the islet and Pointe de Nui-Dat (*Lat. 11° 53′ N., Long. 109° 07′ E.*) there is a sea-wall, partly under construction. A coral patch, with a depth of less than one foot (0m3) over it, lies about 4 cables south-eastward of Pointe de Nui-Dat.

Anse de Ba-Ngoi, which is shallow, is entered between Pointe de Nui-Dat and Xom Con (Kon), a point about 1¾ miles north-eastward. Ba-Ngoi station stands on this point. The shores of the bay are

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Chart 3028, plan of Kam-Ranh bay and approaches.

fringed by banks, which dry, extending out from 1¼ to 3 cables. For a distance of about 6 cables northward of Pointe de Nui-Dat the shore bank consists of coral, and there are two detached coral patches, which dry less than one foot (0m3), about 1½ cables outside the shore bank and 4 and 5½ cables, respectively, north-eastward of the point. Several rivulets discharge into the north-western side of the bay, where the drying shore bank extends out about 3 cables. At the head of the bay, where there is a village, the shore bank is narrow, and on the north-eastern side of the bay it consists of coral extending out about 1½ cables.

A coral bank, which dries, extends 4 cables southward from Xom Con, and a railway pier, with a T-shaped head, about 260 feet (79m2) long, extends a short distance beyond the bank. In 1948, the head of the pier was reported to be in a bad state of repair, and only the western portion of it was stated to be capable of use.

A light is exhibited, at an elevation of 23 feet (7m0), from a white pyramid with black bands on a platform, about 21 feet (6m4) in height, on the eastern end of the T-head of the pier.

A shoal, with a depth of 12 feet (3m7) over it, lies close southward of the eastern part of the pier-head.

Banc de Da-Bac (Da-Bak), nearly awash, lies about half a mile southward of the pier-head.

A light is exhibited, at an elevation of 29 feet (8m8), from a tower, on the middle of Banc de Da-Bac, and beacons stand close north-westward and south-eastward of the tower.

On the north-western side of Baie de Cam-Ranh, between Xom Con and Pointe de Ba-Lum, about 3¼ miles north-eastward, the coast is fringed by a drying coral bank, which extends from about 2 to 5 cables offshore. Rocher Da-Do, a white rock, 21 feet (6m4) high, lies 9 cables north-eastward of Xom Con and close offshore. Roche Da-Nau, which dries nearly 2 feet (0m6), lies about 8½ cables south-eastward of Rocher Da-Do. A shoal, with a depth of 14 feet (4m3) over it, lies 3½ cables north-north-eastward of Roche Da-Nau. A rock, which dries 2 feet (0m6), lies close off the edge of the coastal bank about 6 cables east-south-eastward of Rocher Da-Do, and a detached patch of coral, which dries 3 feet (0m9), lies about 6 cables east-north-eastward of the same rock.

There are three patches of mangrove on the edge of the coastal bank about three-quarters of a mile, one mile, and 1¼ miles, respectively, north-eastward of Rocher Da-Do, all about a quarter of a mile offshore. A detached coral patch, which dries 2 feet (0m6), lies about 4 cables south-westward of Pointe de Ba-Lum and a quarter of a mile offshore; two rocks, awash, lie 1½ and 4½ cables, respectively, south-westward of this coral patch, within the 3-fathom (5m5) line.

Two towers stand close inland on the north-western side of Baie de Cam-Ranh, one about 6 cables northward of Rocher Da-Do, and the other about 8 cables north-north-westward of Pointe de Ba-Lum (*Lat. 11° 56′ N., Long. 109° 11′ E.*).

Several mountains lie north-westward of Baie de Cam-Ranh, the highest of which are Le Pelé (chart 1008), 2,461 feet (750m1) high, lying about 6¾ miles west-south-westward of Pointe de Ba-Lum, and Nui Hon Rong, 2,419 feet (737m3) high, about 3¾ miles west-north-westward of the same point.

Charts 3883, 1008, 1342, 2660a, 2661a, 1263.

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Chart 3028, plan of Kam-Ranh bay and approaches.

On the eastern side of Baie de Cam-Ranh between Mui Hon-Lan (page 242) and Pointe Bai-Sau, about 1¾ miles northward, the coast is fringed by a drying bank which extends about 1½ cables offshore in places. Pointe de la Pagode (Pagoda), 211 feet (64m3) high, lies 5½ cables northward of Mui Hon-Lan. Cam-Linh village stands on Pointe Bai-Sau, and a settlement, in which there is a conspicuous house, stands a short distance south-eastward of the point. Two piers, about one cable apart, extend a short distance offshore near the settlement. Some of the buildings near the settlement are in ruins. A tower stands about half a mile south-eastward of Pointe Bai-Sau.

A light is exhibited, at an elevation of 28 feet (8m5), from a white conical tower, with black bands, about 25 feet (7m6) in height, on Pointe Bai-Sau.

A sandbank, which dries 2 feet (0m6), extends 3 cables westward from Pointe Bai-Sau, and continues half a mile farther, with depths of from one to 4 feet (0m3 to 1m2) over it, and is steep-to on its southern side. In 1948, this bank had extended farther westward than charted.

Nui Trong, a bare yellow sandhill, 595 feet (181m3) high, lies about 1¾ miles east-north-eastward of Pointe Bai-Sau.

The coast between Pointe Bai-Sau and Pointe de Con Xung (Kon Xung), about 2½ miles northward, is fringed by a bank of sand and mud, which dries, extending half a mile offshore in places, and with depths of less than 3 fathoms (5m5) over it, extending about 1½ miles offshore.

On the western side of the bay between Pointe de Ba-Lum and Pointe des Pécheries, about 1¾ miles north-north-eastward, the coast is fringed by a bank, which dries 2 feet (0m6), extending from 2 to 5 cables offshore; a shoal, which dries one foot (0m3), lies about 6 cables east-south-eastward of Pointe de Ba-Lum. A similar bank extends about 6 cables south-westward from Pointe de Con Xung, leaving a narrow channel between the two banks, with a least depth of about 7 feet (2m1).

Lagune de Thuy-Trieu (Thui-Trieu) is entered between Pointe de Ba-Lum and Pointe de Con Xung. It extends about 12 miles northward, parallel with the coast, to a marsh separated from the sea by Plage de Thuy-Trieu (Dgiai beach), a narrow neck of land consisting of sandhills and a barren, sandy plain (chart 1008). The lagoon is not navigable, and a number of old fishing stakes stretch across it in a north-westerly direction from Pointe de Con Xung.

Anchorage. — Directions. — Prohibited areas. — Vessels can anchor anywhere in Baie de Cam-Ranh, according to draught, except in the prohibited areas.

All vessels, except those belonging to the French government, are prohibited from entering the areas north-eastward of a line joining Mui Nam, Mui Hon-Lan light-tower and Rocher Da-Do.

Anchorage is also prohibited north-eastward of a line joining the southern extremity of Île Tagne (*Lat. 11° 50′ N., Long. 109° 14′ E.*), Rocher Doigt (page 242), and Rocher Da-Do.

These areas are indicated by pecked lines on the chart.

Some mooring buoys lie southward of the piers at the settlement southward of Pointe Bai-Sau.

There is no difficulty in reaching an anchorage in Baie de Cam-Ranh, as the channel through Grande Passe is deep and clear of danger.

Charts 3883, 1008, 1342, 2660a, 2661a, 1263.

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Chart 3028, plan of Kam-Ranh bay and approaches.

Settlements.—Storm signals.—Ba-Ngoi and the settlement on Pointe Bai-Sau are connected to the general telegraph system. Coasting vessels call at Ba-Ngoi, which is connected to the railway system. There is a Custom house at Ba-Ngoi, and provisions can be obtained.

Storm signals are displayed at Ba-Ngoi. *See* page 18.

COAST.—Between Pointe de Cam-Ranh (page 240) and a point about 1½ miles north-westward the coast is high and cliffy. Rocks above water extend about a quarter of a mile from the latter point. Baie de Ba-Dai is entered between this point and a point about 2¼ miles northward. A narrow bank, with a depth of one foot (0m3) over it, fringes the shore of the bay. A ledge, on which there are some islets and rocks both above and below water, extends half a mile south-south-eastward from the northern entrance point of the bay; a rock, awash, lies at the extremity of this ledge, about 2½ cables south-south-eastward of the largest islet, which is 73 feet (22m3) high. A bank, on which there are two islets, extends about 7 cables eastward from the northern entrance point of the bay; the eastern of these two islets is 53 feet (16m2) high.

Between the northern entrance point of Baie de Ba-Dai and Pointe Hon Nai, which is bare and rocky, about 1¼ miles north-north-eastward, the coast is steep and cliffy, with rocks, some of which dry, lying close offshore. A ledge, on which there are some rocks above water, extends about 1½ cables east-north-eastward from Pointe Hon Nai; at the outer extremity of the ledge there is a shoal with a depth of 15 feet (4m6) over it.

Anse de la Carcasse is entered between Pointe Hon Nai and a point about 1¼ miles north-north-westward. Some rocks above water lie close offshore in the southern part of this bay, and also along its western side. A rock, 9 feet (2m7) high, lies 3 cables south-eastward of the northern entrance point of the bay. Nui Chut (Shut), 477 feet (145m4) high, lies about three-quarters of a mile westward of the same point.

A rocky shoal, with a depth of 7 fathoms (12m8) over it, lies about 1¼ miles north-eastward of Nui Chut, and a similar rocky shoal (chart 1008) lies about 2½ miles northward of the same hill, 1½ miles offshore. During the South-west monsoon anchorage can be obtained northward of Nui Chut.

Charts 3883, 1008.

Plage de Thuy-Trieu (Dgiai beach), bordered by low sandhills close inland, lies between the northern entrance point of Anse de la Carcasse and a point about 9½ miles north-north-westward; Mui Dong Ba, about 2 miles farther north-north-eastward, is situated on the western side of the southern approach to Baie de Nhatrang and is the eastern extremity of a range of mountains and rises steeply from the sea; Le Tondu, a peak, 2,156 feet (657m1) high, lies about 1½ miles westward of Mui Dong Ba, and Nui Cau Hin, the summit of the range, 3,206 feet (977m2) high, lies about 3½ miles west-north-westward of Le Tondu.

Nui Ba Koum, a peak, 4,656 feet (1,419m2) high, is situated about 15 miles south-westward of Mui Dong Ba.

Off-lying islets and dangers.—Îles des Pêcheurs (Fisherman isles) are a group lying north-north-eastward of Pointe Hon Nai. Hon Nai (*Lat. 12° 00′ N., Long. 109° 19′ E.*), 361 feet (110m0) high,

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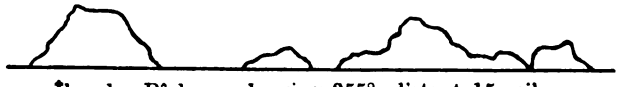
Charts 3883, 1008.

steep and sharp, with a white cairn on its summit, is the southernmost of the group and lies about 3¾ miles north-eastward of the point. A sunken ledge, with depths of from 2¼ to 7 fathoms (4m1 to 12m8) over it, extends about three-quarters of a mile north-westward from Hon Nai.

Roche Vulcan, with a depth of 5 feet (1m5) over it, and a depth of 4¼ fathoms (7m8) close north-westward, lies half a mile northward of Hon Nai; there is deep water between Roche Vulcan and the ledge extending north-westward from Hon Nai.

Hon Ngoai (Ngai) is the largest of this group; its summit, 331 feet (100m9) high, on which is a white cairn, lies 2 miles northward of Hon Nai. An islet, 148 feet (45m1) high, lies close south-eastward of the southern end of Hon Ngoai, and another islet, 66 feet (20m1) high, lies about 1¼ cables farther southward, with some rocks above water between the two islets. An islet, 122 feet (37m2) high, lies close north-eastward of the northern extremity of Hon Ngoai, and another islet, 141 feet (43m0) high, lies about one cable farther northward, and is the northernmost islet of the group. *See* view A on chart 1008.



Îles des Pêcheurs, bearing 255°, distant 15 miles.
(*Original dated* 1933.)

Banc Castlereagh lies from 1¾ to 4¼ miles westward of Hon Ngoai. There is a depth of 33 feet (10m1) near the eastern end of the bank, about 2 miles from the islet, and a depth of 32 feet (9m8) near the western end of the bank, 3¾ miles westward of Hon Ngoai and 3 miles from the mainland.

Bancs de Thuy-Trieu, on which are several shoal heads, lie northwestward of Banc Castlereagh; the shoalest of these heads, with a depth of 2 fathoms (3m7) over it, lies about 4½ miles south-south-eastward of Mui Dong Ba, and about 3 miles offshore.

Banc du Tondu, with a least depth of 3 fathoms (5m5) over it, lies about 2½ miles southward of Mui Dong Ba and about 1¾ miles offshore.

Vessels without local knowledge should not pass between Îles des Pêcheurs (*Lat. 12° 02′ N., Long. 109° 19′ E.*) and the coast.

BAIE DE NHATRANG AND APPROACHES.—Several islands, the largest of which is Hon Lon, and Grand Banc, an extensive shoal, lie in the approaches to Baie de Nhatrang.

The southern approach is entered between Mui Dong Ba and Mui Rach Trang, the eastern extremity of Hon Lon, about 7½ miles east-north-eastward. The eastern approach lies between Mui Rach Trang and Mui Ban Than (Cape Vert), about 12 miles northward. *See* views A and B on chart 1008.

Southern approach.—Islands and dangers.—Lights.—On the western side of the southern approach to Baie de Nhatrang, between a point 8½ cables northward of Mui Dong Ba and a point about 1¾ miles north-north-westward, there is a bight, encumbered by coral reefs which extend about three-quarters of a mile from the head of the bight and which dry in places. A rock, 12 feet (3m7) high, lies on the outer edge of the reef near the middle of the bight.

Charts 1342, 2660a, 2661a, 1263.

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Charts 3883, 1008.

Hon Mieu (*Lat. 12° 11′ N., Long. 109° 13′ E.*), 312 feet (95m1) high, lies on the northern end of a bank, with depths of less than 5 fathoms (9m1) over it, which extends about 2½ miles northward from the southern side of the above-mentioned bight. The western extremity of Hon Mieu lies about half a mile north-eastward of the northern entrance point of the bight. There are two villages on the island.

Cua Bé is entered between the last mentioned point and a point on the southern side of a hilly peninsula, about one mile northward. Massif du Cua Bé, 1,076 feet (328m0) high, lies on the south-western side of the entrance to Cua Bé, and Massif de Chut, the summit of the peninsula on the northern side of the entrance, is 509 feet (155m1) high. The coastal bank, with depths of less than 5 fathoms (9m1) over it, extends about 4 cables from the entrance of Cua Bé and there are depths of over 6 fathoms (11m0) between the edge of the coastal bank and Hon Mieu. Cua Bé is encumbered by a bank of mud and sand, but there is a narrow channel at low water by which small craft, with local knowledge, can reach Trong Dong, a village distinguishable by its coconut trees and pagodas, situated on the south-western side of the peninsula, on the northern side of, and about half a mile within, the entrance. Several streams discharge into Cua Bé, one of which is connected with Rivière de Nhatrang (page 252).

Mui Chut (Chut point) lies about 6 cables north-eastward of Massif de Chut. There is a jetty about 2 cables southward of Mui Chut at which landing can be effected; a buoy is moored about one cable north-north-eastward of the jetty.

A light is exhibited on request, at an elevation of 138 feet (42m1), from a tower on a white house, about 49 feet (14m9) in height, on Mui Chut. Two lights are exhibited from the jetty situated about 2 cables southward of Mui Chut.

Hon Lon lies on the north-eastern side of the southern approach. There are three mountain ranges in the island, connected by low isthmuses. The summit of the eastern range is 1,368 feet (417m0) high and lies nearly 1½ miles north-westward of Mui Rach Trang; the summit of the centre range is 1,565 feet (477m0) and that of the western range, 686 feet (209m1) high. The island is densely wooded and there are steep cliffs in places.

A ridge, on which are some islets and rocks above water, extends three-quarters of a mile east-south-eastward from Mui Rach Trang (*Lat. 12° 12′ N., Long. 109° 20′ E.*). The highest of these islets, Hon Noc (Nok), has an elevation of 191 feet (58m2); the outermost rock is 25 feet (7m6) high and steep-to.

A light is exhibited, at an elevation of 335 feet (102m1), from a white circular tower with black bands, about 47 feet (14m3) in height, on Mui Rach Trang. In 1948, the light was extinguished.

On the southern side of Hon Lon, about 1¼ miles westward of Mui Rach Trang, is the eastern entrance point of an indentation, about 1¼ miles wide, in which there are two bays; Vung Dam Chinh (Chinh bay), the eastern bay, is situated close within the entrance, and Vung Dam Lom (Lom bay), the other bay, in the northern part of the bight.

Hon Mung, 594 feet (181m0) high, lies outside the entrance of the above bight, about 2 miles south-westward of Mui Rach Trang. There are irregular depths of 7 to 15 fathoms (12m8 to 27m4) in the fairway between Hon Lon and Hon Mung. Rocher Rond, 227 feet (69m2)

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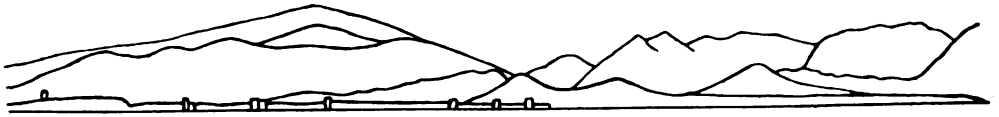
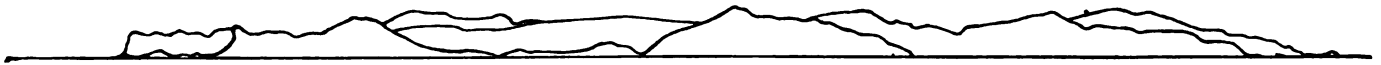
To face page 249.



Duc Ba,
bearing 326°.

Southern entrance to Baie de Nhatrang.

(*Original dated* 1933.)



Ile Bac. *Baie de Van Fong.* *Hon Lon.* *Lach Cua Bé,* *bearing 328°,* *distant about 6 miles.* *Mui Doi,* *bearing 002°.*

Approach to Baie de Ben Goï from south-eastward.

(*Original dated* 1933.)

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Charts 3883, 1008.

high, lies close off the eastern end of Hon Mung and another rock, above water, lies close off its north-eastern side, about half a mile north-westward of Rocher Rond.

Hon Mot, 305 feet (93m0) high and wooded, lies about 1¼ miles west-north-westward of Hon Mung, separated from the south-western side of Hon Lon by a channel about 1½ cables wide with a depth of 6½ fathoms (11m9) in the fairway. The north-western and south-eastern extremities of Hon Mot are fringed by rocks, above water; those from the south-eastern extremity extend about 1½ cables offshore.

Roche du Lion, with a depth of 2 fathoms (3m7) over it, lies 3½ cables westward of Hon Mot. Due Ba (Triple peak) (page 251), bearing about 326° and just open south-westward of Mui Nam, leads close south-westward of Roche du Lion. *See* view facing this page.

Hon Tam, 378 feet (115m2) high, which has not a well defined summit, lies in the middle of the southern approach to Baie de Nhatrang, about 1¼ miles westward of Hon Mot. The islet is fringed by a narrow reef which is steep-to.

The south-western side of Hon Lon from abreast Hon Mot to Mui Nam, is clear of dangers except for a rock, with a depth of 1¾ fathoms (3m2) over it, which lies close south-westward of that point. A bank, with depths of less than 5 fathoms (9m1) over it, extends about 3 cables north-westward from Mui Nam. Mui Nam is the north-western entrance point of a bight nearly one mile wide at its entrance.

There are two villages on Hon Lon, but the approach to them is obstructed by fishing stakes during the fishing season.

The eastern and northern sides of Hon Lon are described on page 250.

Anchorages.—During the North-east monsoon vessels can find good anchorage in either Vung Dam Chinh or Vung Dam Lom, on the southern side of Hon Lon.

There is anchorage, frequented by junks, westward of Hon Mieu. During the South-west monsoon this anchorage is sheltered from the swell which frequently comes from a south-easterly direction. During the North-east monsoon the anchorage is sheltered from the heavy swell by the north-western end of Hon Lon.

Directions.—Approaching Baie de Nhatrang from southward, a vessel should pass eastward of Îles des Pêcheurs and proceed either between Hon Mieu and Hon Tam or between the latter and Hon Mot, avoiding Roche du Lion as directed above.

Eastern approach.—Islands and dangers.—Hon Dong (Pyramid island), 712 feet (217m0) high and prominent, with a framework tower on its summit, lies in the eastern approach to Baie de Nhatrang, about 4½ miles north-north-eastward of Mui Rach Trang. The islet is steep-to and bordered at the base of its cliffs by a narrow ridge of shingle. There is slight vegetation on it.

Hon Ho (Kau island) (*Lat. 12° 17′ N., Long. 109° 22′ E.*), 364 feet (111m0) high and bare, lies about 6 cables north-eastward of Hon Dong; this island resembles a ruined castle from the offing. Two rocks lie off its southern end; the outer, 243 feet (74m1) high, at a distance of about 2 cables, and the other, 62 feet (18m9) high, at a distance of one cable.

Hon Cha La (Shala island), 446 feet (135m9) high and rocky, lies in the north-eastern part of the approach, about 2½ miles south-eastward of Mui Ban Than. Hon Cha La is bare except for some scrub

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Charts 3883, 1008.

on its summit, on which is a prominent boulder. A bank, with a depth of 8 fathoms (14m6) over it and greater depths around, lies about one mile south-eastward of Mui Ban Than.

Charts 3028, plan of Ben Goï anchorage and approaches, 3883, 1008.

On the north-western side of the eastern approach to Baie de Nhatrang, Mui Ban Than is the eastern extremity of a mountainous and wooded peninsula, about 12 miles long, which separates Baie de Binheang (Binkang), (page 252), from Baie de Van Fong (page 254). Hon Heo (Central summit), the summit of this peninsula, 2,689 feet (819m6) high, is situated near the centre of its south-eastern end, about 4 miles westward of Mui Ban Than.

Phu Mai Nha, 2,378 feet (724m8), and Nui Tien Du, 2,548 feet (776m6), high, lie about 4½ miles north-north-westward and 7 miles north-westward, respectively, of Hon Heo.

Charts 3883, 1008.

Between Mui Ban Than and Mui Bai Co, three-quarters of a mile south-south-westward, the coast rises steeply to an elevation of 1,006 feet (306m6). Baie Nuoc Nhi is entered between Mui Bai Co and Mui Bai Chuong, about three-quarters of a mile south-westward; its north-western shore is fringed by a drying reef.

Mui Hon Do (Cape Spec), about 3 cables south-south-westward of Mui Bai Chuong, is the southern extremity of a peninsula, 666 feet (203m0) high, which is joined to the mainland by a low neck of land.

Baie Cai Sung (Xung), which is foul, is entered between Mui Hon Do and Mui Hon Thi (Sèche point), about 2½ miles south-westward. Plateau Giang Bo, a coral reef, which dries 3 feet (0m9), lies about midway between the entrance points of the bay. A patch of coral, which dries 2 feet (0m6), lies about one cable northward, and a spit, with a depth of 2 feet (0m6) at its outer end, extends about 2½ cables southward from Giang Bo. From a point about 6 cables north-north-eastward of Mui Hon Thi, a spit, with a depth of 2¼ fathoms (4m1) over it, extends about 3 cables offshore.

Hon Bac (Sèche islet), 53 feet (16m2) high, with rocks close off its north-western and eastern sides, lies about 1½ miles east-south-eastward of Mui Hon Thi (*Lat. 12° 21′ N., Long. 109° 17′ E.*).

Baie de Binheang (page 252) is entered between Mui Hon Thi and Mui Khé Ga (Khe Ga point), about 4 miles south-westward.

The northern side of Hon Lon forms the southern side of the eastern approach to Baie de Nhatrang. Mui Guéao, the north-eastern extremity of Hon Lon, lies about 1½ miles northward of Mui Rach Trang (page 247).

Vung Dam Tré (Tré bay), divided into two portions by a small projection on its south-western side, is entered between Mui Tré, situated about three-quarters of a mile west-north-westward of Mui Guéao and Mui Sake, about 1¼ miles westward. A shoal, with a depth of 2¾ fathoms (5m0) over it, lies about half a mile south-westward of Mui Tré and a short distance from the eastern side of Vung Dam Tré.

Mui Bo Co, the northern extremity of Hon Lon, is situated nearly 2 miles westward of Mui Sake. There is a coastal reef of coral, which dries and extends about one cable offshore, at the head of the bight which separates the two points.

Grand banc lies near the middle of the eastern approach to Baie de Nhatrang; the depths on this bank are very irregular. Roche du

Charts 1342, 2660a, 2661a, 1263.

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Charts 3883, 1008.

Nord-Ouest, the shoalest head, with a depth of about one foot (0m3) over it, coral, lies about 2½ miles eastward of Mui Khé Ga. Roche Bourayne, another shoal head, with a depth of 6 feet (1m8) over it, coral, lies about three-quarters of a mile south-eastward of Roche du Nord-Ouest. Irregular depths extend about 2¼ miles eastward from Grand banc. The western extremity of Hon Heo (Bak island) (page 250), bearing about 000° and well open eastward of Mui Ban Than, leads eastward of this bank, and westward of Hon Dong, which can be safely approached on its western side to a distance of 2 cables.

Anchorages.—Directions.—During the South-west monsoon, secure anchorage can be found by vessels with local knowledge in either Vung Dam Tré or Vung Dam Lia, on the northern side of Hon Lon

Approaching from north-eastward, a vessel should pass within a distance of half a mile of the north-western end of Hon Cha La and well outside the line joining Mui Hon Do and Mui Hon Thi. If passing north-westward of Grand banc, she should keep well over towards Île Tortue (*Lat. 12° 17′ N., Long. 109° 14′ E.*).

Baie de Nhatrang.—Dangers.—Baie de Nhatrang is entered from southward between Mui Chut and Mui Nam, the north-western extremity of Hon Lon, about 1¼ miles north-eastward. (*See* view facing page 249.) It is entered from eastward between Mui Bo Co and Mui Khé Ga.

Vung Dam Lia (Lia bay), entered between Mui Bo Co and Mui Lang, 1¼ miles west-south-westward, is divided into two by a projection on its south-western side. A rocky patch, with a depth of 2 fathoms (3m7) over it, lies on the eastern side, about one mile south-south-westward of Mui Bo Co and 1½ cables offshore. The head of the eastern portion of the bay is encumbered with reef, which dries out for about 3½ cables, and there is a narrow drying bank at the head of the western portion.

Between Mui Lang and Mui Nam, the north-western end of Hon Lon is fringed by a narrow coral reef, which dries. Rocher Noir (Black rock), 2 feet (0m6) high, lies about a quarter of a mile off this part of the coast, about 6 cables northward of Mui Nam. A ledge, with depths of less than 5 fathoms (9m1) over it, extends about 3 cables west-south-westward from Rocher Noir.

Between Mui Chut and the southern entrance point of Rivière de Nhatrang, about 3 miles northward, the south-western shore of the bay is fronted by a narrow sandy beach, backed by sandhills. The village of Chut stands close westward of Mui Chut. A rocky patch, with a depth of 7 fathoms (12m8) over it, lies about 2 cables north-eastward of Mui Chut.

On the northern side of the bay Mui Khé Ga rises steeply from the sea to several peaks, the highest of which, situated about 1½ miles westward of the point, has an elevation of 1,214 feet (370m1). Due Ba (Triple peak), 1,880 feet (573m0) high, lies about 5½ miles north-westward of Mui Khé Ga.

Île Tortue (Tortoise island), 161 feet (49m1) high, so named from its resemblance to a tortoise, lies about 8 cables southward of Mui Khé Ga. Its eastern side is clear of danger, but a coral reef, which dries 2 feet (0m6), extends about 2¾ cables westward from the islet.

Between the northern entrance point of Rivière de Nhatrang and

Charts 1342, 2660a, 2661b, 1263.

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Charts 3883, 1008.

Mui Khé Ga there is a bight, the northern shore of which is fringed by a coral reef, which dries. A detached coral reef, which dries 2 feet (0m6), lies from one to 4 cables offshore, about 1¼ miles south-westward of Mui Khé Ga. A bank, with depths of less than 5 fathoms (9m1) over it, extends about 1¼ miles from the head of the bight. Île Tortue (page 251) lies on the north-eastern end of this bank. In the channel, about 3 cables wide, between the coral reef extending westward from Île Tortue and the coast, there are depths of about 22 feet (6m7) in the fairway.

Rocher Blanc (White rock), 21 feet (6m4) high, lies one mile eastward of the northern entrance point of Rivière de Nhatrang; depths of one foot (0m3) and less extend about one cable southward and westward from Rocher Blanc, and a rock, with a depth of less than 6 feet (1m8) over it, lies about 3 cables north-westward of it, near the edge of the 5-fathom (9m1) line and about 4¼ cables offshore.

Île Brière, 46 feet (14m0) high and covered with bushes, lies on the outer edge of the coastal reef, which dries, extending a quarter of a mile offshore, about half a mile north-eastward of the northern entrance point of Rivière de Nhatrang.

The mouth of Rivière de Nhatrang is about one cable wide. Two rocks, about 8 feet (2m4) high, lie near the outer edge of a coral reef, which dries, and extends about 3 cables south-eastward from the northern entrance point. A rocky shoal, with a depth of 4 fathoms (7m3) over it, lies a short distance outside the coastal bank, about half a mile south-eastward of these rocks. A bank of sand, which dries, with a rock, which dries 5 feet (1m5), close southward of its outer extremity, extends about one cable eastward from the southern entrance point of the river. The river is obstructed by a bar, about 3 cables wide, southward of its entrance.

Cu Huan, a fishing village, is situated on a low strip of sand which extends about 3 cables southward from the southern entrance point.

The town of Nhatrang, in which is the Residency, a small fort, and other buildings, is situated along the shore of the bay southward of Cu Huan. Xulao (*Lat. 12° 16′ N., Long. 109° 12′ E.*), a large village in a clump of coconut trees, stands on the northern bank of the river, just within the mouth.

Above the bar, Rivière de Nhatrang is navigable for boats for a distance of about 30 miles; Khanh-Hoa, the capital of the province, is situated about 7 miles from the mouth.

There is only one high water daily in Baie de Nhatrang.

Landing is easy on the beach; boats with local knowledge can enter the river.

Communication.—Supplies.—There is regular steamer communication with Indo-Chinese ports; Nhatrang is also connected to the railway system, the station being about 3 miles inland.

There is a post and telegraph office at Nhatrang.

Fresh provisions can be obtained.

Storm signals.—Storm signals are displayed. *See* page 18.

Baie de Binheang.—Anchorage.—For the entrance to Baie de Binheang (Binkang) or Vung-Thuc, *see* page 250. An islet, 171 feet (52m1) high, with a rocky patch, which dries, about half a mile south-westward of it, lies on the south-western side of the bay, about 3½ miles north-westward of Mui Khé Ga and three-quarters of a mile offshore.

Charts 1342, 2660a, 2661a, 1263.

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Charts 3883, 1008.

There are depths of less than 3 fathoms (5m5) westward of a line joining the eastern end of this islet and a point on the south-western shore of the bay about 2 miles southward.

Hon Thi, 738 feet (224m9) high, lies on the north-eastern side of the bay, about 4 miles north-westward of Mui Hon Thi and about half a mile offshore. Hon Sam, 121 feet (36m9) high, lies close off the western side of Hon Thi, and Hon Trong, 177 feet (53m9) high, and Hon Rou, 233 feet (71m0) high, lie on a reef which extends three-quarters of a mile west-north-westward from the north-western extremity of Hon Thi. Hon Nua, 121 feet (36m9) high, lies about three-quarters of a mile westward of Hon Rou.

The depths in Baie de Binheang gradually decrease as the above islands are approached. North-westward of the islands is a shallow marshy inlet which is the common estuary of several rivers.

Baie de Binheang affords good anchorage during both monsoons, in any convenient depth less than 10 fathoms (18m3).

Chart 3028, plan of Ben Goï bay and approaches.

BAIE DE BEN GOÏ AND APPROACHES.—Baie de Ben Goï is approached between Mui Ban Than (page 250) and Mui Ganh, the southern extremity of Presqu'île de Hon Gom, about 11 miles north-eastward. Presqu'île de Hon Gom is joined to the mainland about 15 miles north-north-westward of Mui Ganh, by a low and narrow isthmus, about 5 miles long, which forms the north-eastern side of Baie de Ben Goï. About the middle of the peninsula, a mountainous projection extends about 4 miles south-westward from its western side. Hon Nhon, the summit of this projection, situated about 8 miles north-north-westward of Mui Ganh, is 1,475 feet (449m6) high, and is prominent; La Table, 1,200 feet (365m8) high, lies 2 miles north-eastward of Hon Nhon. The southern end of Presqu'île de Hon Gom is mountainous; Le Doigt, 1,039 feet (316m7) high, lies 3½ miles north-north-westward of Mui Ganh, and Mont Chauve lies about three-quarters of a mile northward of the same point; both these peaks are prominent.

Hon Lon lies off the south-western side of Presqu'île de Hon Gom and is separated from it by narrow channels which lead into Baie de Ben Goï.

On the south-western side of the approach to Baie de Ben Goï, Baie de Cai Ban (Kai Ban bay) is entered between Mui Ban Than and Île Longue, about 5 miles north-westward. Islands and dangers extend about 4 miles eastward from Île Longue.

Baie de Van Fong, which leads into Baie de Ben Goï from southward, is entered between Île Longue and Mui Co (Ko) (*Lat. 12° 33′ N., Long. 109° 25′ E.*), the south-eastern extremity of Hon Lon, 6¾ miles north-eastward. *See* view facing page 249.

Charts 3883, 1008.

Several mountain peaks, frequently obscured by clouds, especially during the North-east monsoon, lie north-westward of Baie de Ben Goï. La Mère et L'Enfant (Mother and Child), 6,726 feet (2,050m1) high, prominent and surmounted by two rocks which appear like fingers of unequal size, lies about 30 miles north-westward of Mui Ban Than and 16 miles inland; Nui Hon Chao (Diadem mountain), 4,930 feet (1,502m6) high, lies about 10½ miles east-north-eastward of La Mère et L'Enfant.

Charts 1342, 2660a, 2661a, 1263.

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Chart 3028, plan of Ben Goï bay and approaches.

Nui Da Den, 2,036 feet (620m6) high, lies 3½ miles south-south-eastward of Nui Hon Chao. Sommet Conique, 2,650 feet (807m7) high, lies about 3 miles east-south-eastward of Nui Hon Chao. Hon Giup, which has a double conical summit, 3,700 feet (1,127m8) high, lies about 7 miles north-eastward of Sommet Conique.

Baie de Cai Ban.—Dangers.—Banc de Deo Ngan, with depths of less than 36 feet (11m0) over it, extends about 2¾ miles northward from the head of a bight situated about one mile north-westward of Mui Ban Than. At the outer end of the bank there are depths of 23 feet (7m0); in the middle, about 1½ miles offshore there are depths of 21 feet (6m4), coral and rock; and about 4 cables north-north-westward of the eastern entrance point of the bight there is a rock awash.

The western shore of the bay for about 2 miles southward of the northern entrance point is fringed by a coral reef, which extends nearly 2 cables offshore, beyond which a bank, with depths of less than 3 fathoms (5m5) over it, extends a further 2½ cables.

Île Longue, 248 feet (75m6) high, is connected to the mainland by a coral ledge, which dries, about 2 cables wide; this ledge also fringes the southern and south-eastern sides of the island. Île Noire lies on the outer end of a bank, which partly dries, extending about 6½ cables offshore about 6 cables southward of Île Longue.

Le Bouton, 25 feet (7m6) high, is the outermost of the chain of islands extending eastward from Île Longue; it lies on the south-western side of a shoal, with depths of from 7 to 10 feet (2m1 to 3m0) over it; a rock, which dries, lies about one cable northward of the island.

Hon Heo or Île Bac, 456 feet (139m0) high, bare and rocky, lies 9 cables westward of Le Bouton. A rock, above water, lies close northward of the eastern end of Hon Heo, and a coral patch, with a depth of 46 feet (14m0) over it, lies 6 cables south-westward of the southern extremity.

Île du Milieu, 153 feet (46m6) high, lies about one mile westward of the northern extremity of Hon Heo. A rocky bank with depths of less than 18 feet (5m5) over it, on which lies a rock above water, extends 4 cables westward from Île du Milieu; there is a depth of 16 feet (4m9) at the extremity of this bank, and depths of from 24 to 36 feet (7m3 to 11m0) lie in the narrow channel between it and Île Longue. A rock, with a depth of 13 feet (4m0) over it, lies about 3½ cables south-south-westward of Île du Milieu; two rocks with depths of less than 6 feet (1m8) over them, the southern one consisting of a pinnacle with two heads, lie 3 and 6½ cables south-south-eastward, respectively of the islet.

Baie de Van Fong.—Islets and dangers.—On the south-western side of the bay there is a bight between Île Longue (*Lat. 12° 29′ N., Long. 109° 18′ E.*) and Pointe de Hon Khoï, about 6¾ miles north-westward. The south-western shore of this bight is fringed by coral. A coral patch, with a least depth of about 2 feet (0m6) over it, lies 3¼ miles southward of Pointe de Hon Khoï and about three-quarters of a mile off the western shore of the bight. About 7 cables southward of this patch a spit, which dries, extends about 3 cables offshore.

Pointe de Hon Khoï is the extremity of a peninsula of the same name, the summit of which is 478 feet (145m7) high and lies about 1½ miles south-south-westward of the point.

Hon Lon (page 253), wooded and mountainous, lies on the north-

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Chart 3028, plan of Ben Goï bay and approaches.

eastern side of Baie de Van Fong; Nui Ba Lon, its flat summit, 1,856 feet (565m7) high, is situated near its northern end, and Le Tricorne, near the southern end of the island, attains an elevation of 1,216 feet (370m6) about one mile north-westward of Mui Co.

Hon Tai lies about 1¼ miles west-south-westward of Mui Co, and 2 cables off the south-western side of Hon Lon. In the narrow passage between Hon Tai and Hon Lon there are depths of less than 5 fathoms (9m1) and the passage is restricted by a shoal, with depths of 6 feet (1m8) over it, which extends eastward from the islet.

The south-western side of Hon Lon, from abreast Hon Tai to Mui Ganh Rong, 4 miles north-westward, is clear of danger. Between the latter point and a point about 1½ miles north-westward there is a bay, in which there is a 4-fathom (7m3) patch lying half a mile north-north-westward of Mui Ganh Rong and about 3 cables offshore. At the head of the bay is the village of Ninh Dao.

Hon Den, 68 feet (20m7) high, lies about three-quarters of a mile west-south-westward of the north-western entrance point of this bay. Except on its eastern side the islet is fringed by a rocky ledge and depths of from 6 to 15 feet (1m8 to 4m6) lie within 2½ cables of its north-western end; a patch, with a depth of 8 feet (2m4) over it, lies 3½ cables west-north-westward.

Lach Cua Be.—Port Dayot.—Islands and dangers.—Lach Cua Be (Lash Kua Be) is entered between Mui Co and Mui Ganh, about 1¼ miles east-north-eastward. Between Mui Co and Pointe Nord-Ouest, about 4½ miles north-north-westward, the eastern side of Hon Lon is clear of danger, except for a sunken rock, which lies about one cable eastward of the latter point.

Roche du Lion, with a depth of 9 feet (2m7) over it, lies about 3 cables southward of Mui Ganh.

The north-eastern side of Lach Cua Be between Mui Ganh and Pointe Nord-Est, 4¾ miles north-north-westward, is indented. About midway between these two points is Vung Thu, a small bay with some rocks, above water, lying close off its eastern shore, and a rock, which dries 4 feet (1m2), close off its northern entrance point.

About half a mile south-south-eastward of Pointe Nord-Est the coastal bank, with a depth of 8 feet (2m4) at its extremity, extends about 2 cables offshore.

Port Dayot is a bay on the western side of Presqu'île de Hon Gom, entered between Pointe Nord-Est and Mui Nai Ba Ken, about 1¾ miles west-north-westward.

Hon Ong (*Lat. 12° 39′ N., Long. 109° 24′ E.*) lies on the eastern side of Port Dayot about one mile north-north-eastward of Pointe Nord-Est and a quarter of a mile off the eastern shore.

A steep-to bank, with depths of 36 feet (11m0) and less over it, extends from the south-western side of the islet and at its outer extremity, about 4 cables from the south-western end of the islet, there is a depth of 19 feet (5m8); midway between this shoal patch and the islet there is a rock, with a depth of 5 feet (1m5) over it. Another rock, with a depth of 5 feet (1m5) over it, lies nearly 2 cables westward of the northern extremity of the islet; the eastern shore of the islet is mainly foul.

Abreast Hon Ong, a drying bank with a rock, 3 feet (0m9) high, lying close off its western edge, extends about 3 cables from the western side

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Chart 3028, plan of Ben Goï bay and approaches.

of Presqu'île de Hon Gom, leaving a narrow channel between the rock and the south-eastern side of Hon Ong. Hon Gam, fringed by a reef, on which are some rocks, above water, lies about 4 cables north-eastward of Hon Ong and 2 cables off the eastern shore.

On the western side of Port Dayot, Hon Do lies about 6 cables east-north-eastward of Mui Nai Ba Ken, with a deep channel about 3 cables wide between it and the shore. The northern and south-western sides of Hon Do are fringed by banks with depths of about 10 feet (3^m0) over them, extending about $1\frac{1}{2}$ cables offshore.

The shores of Port Dayot are indented; Baie Olivier, at the head of which is a drying bank of coral, is situated on the north-western side of the port, and Vung Nai at the northern end. A drying bank, which extends about a quarter of a mile offshore, fringes the north-western side of Vung Nai and there are depths of less than 6 feet (1^m8) half a mile from the head of the bay. Midway between these two bays, a rock, which dries one foot (0^m3), lies about 2 cables offshore, on the edge of the shore bank.

In the neighbourhood of Port Dayot are several villages, where poultry, eggs and fish can be obtained.

Lach Co Co.—Lach Co Co (Lash Ko Ko) is a continuation of Lach Cua Be, and is entered from eastward between Mui Nai Ba Ken and a point on the northern side of Hon Lon about 6 cables southward.

On the northern side of Lach Co Co, Baie du Lutin is entered between Mui Nai Ba Ken and the south-eastern extremity of Hon Sang, about one mile westward. Hon Sang is connected to the western shore of this bay by a narrow drying coral reef. Vung Ké, a small bay in which are several rocks, nearly awash, and the head of which dries, is entered at the north-western end of Baie du Lutin, between the north-eastern extremity of Hon Sang and a point about 3 cables north-eastward.

Hon Sang is fringed by a steep-to bank, with depths of less than 3 fathoms (5^m5) over it, extending $1\frac{1}{2}$ cables from its south-western side; this bank continues to fringe the south-western side of Presqu'île de Hon Gom as far as Mui Co Co, the western extremity; a rock, which dries one foot (0^m3), lies on the edge of this bank about $1\frac{1}{2}$ cables southward of Mui Co Co (*Lat. 12° 40′ N., Long. 109° 19′ E.*).

On the southern side of Lach Co Co, on the northern side of Hon Lan, Bai Tranh is entered westward of a point situated about $1\frac{1}{2}$ miles west-north-westward of Pointe Nord-Ouest; the head of this bay is fringed by a narrow drying bank, and a spit, with a depth of 9 feet (2^m7) over it, extends about $1\frac{1}{2}$ cables north-westward from the eastern entrance point. Between Bai Tranh and the northern extremity of Hon Lon the coast is fringed by a bank, with depths of less than 3 fathoms (5^m5) over it, extending as much as 3 cables offshore; an islet lies on this bank about 3 cables eastward of the northern extremity of Hon Lon, about one cable offshore, and there is a depth of 21 feet (6^m4) close outside the edge of the bank, about 2 cables north-eastward of the islet.

Cua (Kua) Lon is the western end of Lach Co Co and leads into Baie de Ben Goï between the northern extremity of Hon Lon and Mui Co Co.

Anchorages.—In Baie de Van Fong, during the North-east monsoon, vessels can anchor under Hon Lon over a mud bottom, but the anchorage is open south-eastward.

Charts 3883, 1008, 1342, 2661a, 1263.

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Chart 3028, plan of Ben Goï bay and approaches.

In Lach Cua Be, small vessels with local knowledge can make fast to the trees along the shores almost anywhere.

Port Dayot affords land-locked anchorage in any of its bights; Baie Olivier, in which the bottom is mud, is the most frequented. In the North-east monsoon there is a better anchorage in Baie de Vung Thu, in a depth of about 6½ fathoms (11m9), about 1½ cables offshore.

Baie de Ben Goï.—Islands and dangers.—Buoy.—Baie de Ben Goï is entered between Pointe de Hon Khoï (page 254) and the north-western end of Hon Lon. On the south-eastern side of the bay, several islets lie close off the north-western end of Hon Lon. Hon Mai, the outermost of these islets, 196 feet (59m7) high, lies about 1¼ miles westward of the northern extremity of Hon Lon; it is fringed by a bank, with depths of from 5 to 10 feet (1m5 to 3m0) over it, extending about one cable offshore; a detached patch, which dries, lies about 2 cables southward of the islet.

Banc du Milieu, with a depth of less than one foot (0m3) over it, lies about half a mile westward of Hon Mai. Da Bia (chart 1342) (page 261), in line with the summit of Hon Mao (page 259), bearing 023°, leads between Hon Mai and Banc du Milieu, in a depth of about 10 fathoms (18m3).

Hon Me lies nearly 2 cables south-eastward of Hon Mai, separated from it by a very narrow channel. Hon Me is fringed by a shallow bank, extending about one cable offshore, and a rock, which dries 6 feet (1m8), lies on this bank south-eastward of the islet; the depths between the islet and Hon Lon are irregular.

Hon Dung lies about 1½ cables north-eastward of Hon Me, and about 2 cables offshore. Abreast Hon Dung (*Lat. 12° 38′ N., Long. 109° 18′ E.*), a drying coral reef extends about 1½ cables off the north-western side of Hon Lon, leaving a narrow channel between its outer end and Hon Dung.

Hon Ke lies about one cable off the northern extremity of Hon Lon, and is connected to Hon Dung, about half a mile south-westward, by a bank, steep-to on its north-western side, with depths of from 6 to 15 feet (1m8 to 4m6) over it; a depth of 11 feet (3m4) lies on the edge of this bank about 2 cables northward of Hon Dung.

Baie de Hon Khoï, at the south-western end of Baie de Ben Goï, is entered between the northern extremity of Presqu'île de Hon Khoï (page 254) and a point on the western shore about 2 miles north-westward. There are depths of about 19 feet (5m8) between the entrance points, but southward of this line depths decrease fairly rapidly. The western shore of this bay is fringed by a bank of coral and mud, which dries, extending about half a mile offshore; the eastern shore is fringed by a narrow bank, which dries, the northern part of which consists of coral. A rock, with a depth of less than 6 feet (1m8) over it, lies about 1½ cables from the eastern shore, about 8 cables south-westward of the eastern entrance point. A can buoy is moored about 3¼ cables south-south-westward of the rock. Nearly midway between the eastern entrance point and the head of the bay there is an inlet, which dries, and at the head of which are some saltings. On each side of the entrance of this inlet is a jetty, the southern of which was in a bad state of repair in 1950; a dredged channel leads into the inlet. The village of Dong Haï stands on the northern side of the entrance.

Charts 3883, 1008, 1342, 2661a, 1263.

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Chart 3028, plan of Ben Goï bay and approaches.

A mooring buoy is situated about 3¼ cables north-westward of the head of the northern jetty.

The village of Xuan My (Mi), is situated at the head of Baie de Hon Khoï, from which a drying bank extends about 2 cables. A creek, which dries, and on the eastern side of which are some saltings, is entered close eastward of Xuan My.

The importance of Baie de Hon Khoï is due to the production of salt; there is a Custom house on the southern entrance point of the inlet on the eastern side of the bay.

A coral patch, with a depth of 9 feet (2m7) over it, lies 2 miles northward of the northern extremity of Presqu'île de Hon Khoï and about 1½ miles from the western shore of Baie de Ben Goï.

Plateau du La Pérouse, a group of detached shoals with several rocky heads, lies nearly in the middle of the southern end of Baie de Ben Goï. The two shoalest heads, with depths of 2 feet (0m6) over them, about 4 cables apart in a north-westerly direction, lie about 2½ miles westward of Hon Mai; other shoal heads, the positions of which can best be seen on the chart, with depths of between 9 and 16 feet (2m7 and 4m9) over them, lie within 6 cables of the south-eastern of the shoalest heads.

North-eastward of the western entrance point of Baie de Hon Khoï, the north-western side of Baie de Ben Goï is broken by the mouths of numerous rivers. The coast is fringed by drying banks of mud and coral, outside which a bank, with depths of less than 3 fathoms (5m5) over it, extends as much as one mile offshore in places. On this bank are numerous coral patches which dry, and several islets fringed by coral reefs, the largest of which lies about 3½ miles north-north-westward of Pointe de Hon Khoï (*Lat. 12° 35′ N., Long. 109° 14′ E.*).

Many fishing villages, where small supplies of fresh provisions can be obtained, are situated on the coast; Tu Bong, the most important of these villages, lies about one mile inland near the head of Baie de Ben Goï. A tower stands westward of the village of Cao (Kao) Nem, situated about 6 miles north-north-westward of Pointe de Hon Khoï.

A chain of islets lies off this stretch of coast, separated from it by Cua (Kua) Gia, a channel with a least width of 7 cables between the reefs on either side, with depths of not less than 3 fathoms (5m5) in the fairway.

Hon Vung, 65 feet (19m8) high, the south-westernmost of this chain of islets, lies nearly 4 miles west-north-westward of Mui Co Co (page 256) and about 1¼ miles eastward of the outer edge of one of the coral patches on the coastal bank. Hon Vung is fringed by a narrow coral reef; a patch, which dries 2 feet (0m6), lies about 3¾ cables north-eastward, and another patch, which dries 5 feet (1m5), lies about the same distance south-westward of the islet.

Hon Duoc (Duok), Îlot Midi and Hon Bip, connected by coral reefs, lie from 1¼ to 3¾ miles north-eastward of Hon Vung. Hon Bip is 471 feet (143m6) high, and a coral reef, which dries, extends about 3 cables from its north-western side, and a bank, with depths of 18 feet (5m5) and less extends 2 cables farther. A reef, which dries one foot (0m3), lies off the edge of the bank connecting Hon Bip and Îlot Midi, about 3 cables west-south-westward of the southern extremity of Hon Bip. Two rocks, awash, lie on the bank at the north-eastern extremity of Hon Bip.

Charts 3883, 1008, 1342, 2661a, 1263.

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Chart 3028, plan of Ben Goï bay and approaches.

Hon Mot, 94 feet (28m7) high, and fringed by a narrow reef except on its western side, lies about half a mile north-eastward of Hon Bip. A rock, awash, lies off the edge of the reef, about one cable southward of Hon Mot, and a spit, with a depth of 15 feet (4m6) over it, extends about 2 cables eastward from the islet.

Hon Mao, the north-easternmost of the chain of islets, is 48 feet (14m6) high, and lies about 7 cables north-eastward of Hon Mot. A coral reef extends a short distance westward, and about 1½ cables north-eastward from Hon Mao, and outside it is a bank, with depths of one foot (0m3) and 3 feet (0m9) over it, about 3 cables from its eastern and north-eastern sides, respectively.

On the eastern side of Baie de Ben Goï, about one mile north-eastward of Mui Co Co, there is a bank, on which there is a rock, which dries 4 feet (1m2), lying about a quarter of a mile offshore. Between Mui Da Son, situated about 2½ miles north-eastward of Mui Co Co, and the village of Vinh Giat, about 1¾ miles farther north-eastward, the coast is fringed by a bank, which dries from one to 4 feet (0m3 to 1m2), and a rocky ledge at its northern end, extending as much as 4 cables offshore. Hon Tri lies on the edge of this bank about 7 cables north-eastward of Mui Da Son. A shoal, with a depth of 5 feet (1m5) over it, lies about 2 cables south-westward of Hon Tri.

From a point about 1½ miles north-north-westward of Vinh Giat village to the head of Baie de Ben Goï, the coast is fringed by a bank, which dries about 3 feet (0m9), extending as much as 6 cables offshore. A coral patch, which dries 2 feet (0m6), lies about three-quarters of a mile offshore westward of Tuan Le village, which is situated about 3 miles northward of Vinh Giat (*Lat. 12° 43′ N., Long. 109° 23′ E.*).

Vung Trau Nam, a shallow bay, is entered at the northern end of Baie de Ben Goï between Tuan Le and a point about 2 miles west-north-westward. The shores of Vung Trau Nam are bordered by drying banks which extend offshore, on its eastern side as much as 6 cables, and on its western side and at the head, for about a quarter of a mile. The village of Ninh Ma stands at the head of the bay.

Anchorages.—Directions.—In Baie de Ben Goï vessels can anchor as convenient anywhere on the line joining the summit of Hon Mao and Da Bia peak (page 261), bearing 023°, or nearer Presqu'île de Hon Gom.

Baie de Hon Khoï affords good shelter for small vessels with local knowledge, in a depth of about 13 feet (4m0), good holding ground; or farther out, in a depth of 23 feet (7m0), with Hon Mai bearing about 058° and the northern extremity of Presqu'île de Hon Khoï, 126°.

Baie de Ben Goï can be entered either through Lach Cua Be and Lach Co Co, which are deep throughout, or through Baie de Van Fong. If entering from the latter, a vessel should pass between Hon Mai and Banc du Milieu, keeping on the leading line indicated on the chart, which leads fairly close to the islet.

Communication.—The railway connecting the town of Nhatrang (page 252) with the town of Qui-Nhon (page 271) follows the western shore of Baie de Ben Goï and there are stations about one mile westward of the head of Baie de Hon Khoï, at Van Gia, situated about 7 miles south-westward of Tu Bong, and at Tu Bong (page 258).

COAST.—Off-lying islets and dangers.—Between Mui Ganh (page 253) and Mui Hon Cho (Sho), about 4 miles northward, the

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Chart 3028, plan of Ben Goï bay and approaches.

eastern side of Presqu'île de Hon Gom is indented. Hon Trau Nam, a group of eight rocks, about 20 feet (6m1) high, lies about 1½ miles eastward of Mui Ganh. Roche Fortin, with a depth of 9 feet (2m7) over it, lies close north-westward of Hon Trau Nam.

A coral patch, with a depth of one foot (0m3) over it, lies close offshore, about half a mile north-eastward of Mui Ganh. Hon Den, a small group of islets, lies close offshore, about 9 cables north-eastward of Mui Ganh. A rock, with a depth of less than 6 feet (1m8) over it, lies about 2½ cables north-eastward of Hon Den. Hon Kho Tran lies about 1¼ miles north-north-eastward of Hon Den and about 6 cables offshore. A bank, with a depth of 26 feet (7m9) over it, extends about one cable from the south-western side of Hon Kho Tran. Hon Kho lies about one mile north-westward of Hon Kho Tran and close offshore. Between Hon Kho and Mui Hon Cho there are several rocks above water lying close offshore.

Between Mui Hon Cho and Mui Doi, about 1¾ miles north-eastward, there is a bight, the northern side of which is formed by a hilly peninsula, of which Mui Doi, close off which are some sunken rocks, is the south-eastern extremity. Mui Da Chon (Shon) (*Lat. 12° 40′ N., Long. 109° 27′ E.*), about 1¼ miles north-north-westward of Mui Doi, is the north-eastern extremity of this peninsula.

Hon Doi, with sunken rocks close to its western and southern sides, is separated from Mui Doi by a channel about 3 cables wide. Vessels are recommended not to use this channel.

About half a mile westward of Mui Da Chon there is a small bight, the sides and head of which are fringed by a bank; a rock above water lies about one cable northward of the eastern entrance point of the bight, and a rocky ledge, with a depth of 17 feet (5m2) over it, extends 1½ cables north-eastward from its western entrance point. Between the latter point and Mui Hon Ngang, the extremity of a small peninsula nearly 2½ miles north-westward, there is a sandy bay, the southern shore of which is cliffy and indented, and fringed by rocks above water lying close offshore. In this bay a rock above water with another rock, which dries 4 feet (1m2) close eastward, lies about 1¾ miles west-north-westward of Mui Da Chon and a quarter of a mile offshore. The southern side of Mui Hon Ngang is steep-to, but a rocky ledge, with a depth of 15 feet (4m6) over it, extends 1½ cables north-eastward from the point.

The narrow isthmus connecting Presqu'île de Hon Gom with the mainland extending about 6½ miles north-north-westward from Mui Hon Ngang, is bordered by a sandy beach on its seaward side, fringed by a bank, with depths of less than 3 fathoms (5m5) over it, extending about a quarter of a mile offshore. The islands in Baie de Ben Goï can be seen over this isthmus. A mud bank, with a least depth of 10¼ fathoms (18m9) over it, lies about 3 miles northward of Mui Hon Ngang and about 2¼ miles offshore.

Chart 3883.

Northward of Hon Giom, which is connected to the coast by a narrow neck of low land, the coast is low for about 1¼ miles, and fringed by a narrow bank, which dries, thence becoming steep and cliffy. The village of Dai Lanh (Khanh Hoa Gia) stands about 1¼ miles north-north-westward of Hon Giom and a short distance inland.

Hon Nua (Ro), 359 feet (109m4) high, lies in the approach to Vung

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To face page 261.

Mountains in vicinity of Cap Varella from eastward.

(*Original dated* 1865.)

Pulau Gambir and the coast westward of it.

(*Original dated* 1933.)

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Chart 3883.

Ro, about 1¾ miles north-eastward of Hon Giom and 6 cables offshore. Hon Nua is bordered by perpendicular cliffs on its eastern sides, which are steep-to; from its southern end, a reef, which partly dries, extends about one cable, and on the western side of the islet there is a shingle beach and a fishing village.

Vung Ro is entered between Mui La, about 1¾ miles north-eastward of Hon Nua, and a point about 1¼ miles west-north-westward. The shores of this bay are backed by high land; reefs extend a short distance from two of the salient points on the western shore, situated about three-quarters of a mile and 1¼ miles, respectively, from the head of the bay. The eastern side of the bay is formed by the southern end of Cap Varella, a peninsula, on which are three peaks, the highest of which has an elevation of 1,015 feet (309m4). In the entrance of the bay there are depths of 10 fathoms (18m3) which gradually decrease towards the village at its head.

Anchorages.—During the South-west monsoon or in fine weather, vessels can anchor off Dai Lanh, westward of Hon Nua (*Lat. 12° 50′ N., Long. 109° 23′ E.*).

Vung Ro is one of the safest anchorages on the coast of Central Viet-Nam and is frequented by junks in bad weather.

Cap Varella.—Light.—Signal station.—Cap Varella consists of steep cliffs rising to four rocky peaks, three of which are on the peninsula forming the eastern side of Vung Ro. Mui Ba, the south-eastern extremity of the cape, lies about 2 miles east-north-eastward of Mui La. Between Mui Ba and a point, about 2¼ miles northward, there are two small bights, separated from one another by Mui Mao. Thence to Mui Nay, about one mile northward, there is a small bay with a sandy beach, into which a stream descends from the mountains.

A bank, with depths of less than 3 fathoms (5m5) over it, extends about 2 cables eastward from Mui Ba and Mui Mao.

Da Bia, the summit of Cap Varella, 2,293 feet (698m9) high, lies about 3¾ miles north-westward of Mui Mao; on the summit is a prominent rock, resembling a pagoda. *See* view facing this page, and view B on chart 1342.

A light is exhibited, at an elevation of 338 feet (103m0), from a white masonry tower, about 55 feet (16m8) in height, on Cap Varella (*Lat. 12° 54′ N., Long. 109° 27′ E.*).

There is a signal station at Cap Varella, with which vessels can communicate by means of the International Code of Signals either by day or at night.

Storm signals are shown. *See* page 18.

Anchorage.—During the South-west monsoon, vessels can anchor off the bight between Mui Nay and Nui Bai Gok, with Da Bia bearing 233°, in a depth of about 10 fathoms (18m3).

Tidal streams.—At a position 176°, distant 2 miles from Cap Varella lighthouse, the flow sets northward and may obtain a rate of one knot. Along the coast northward of the cape the flow barely exceeds half a knot and is very irregular, being affected by the variable outflows from Song Ong Co and Cua Dai Giang (Chart 1342).

Coast.—Islands and dangers.—Between Mui Nay and Nui Bai Gok, a hill on the coast, about 2¼ miles north-westward, there is a bight with a sandy beach.

Hon Co, a group of rocks, some of which are awash, lies about

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Chart 3883.

1½ miles north-north-eastward of Nui Bai Gok and about the same distance offshore. Roche Percée, the highest, with an elevation of 60 feet (18m3), lies at the south-eastern end of the group and has a large boulder on its summit; when abreast in passing, a hole can be seen through this boulder. With this exception, Cap Varella is safe to approach.

Chart 1342.

Northward of Mui Nay the coast is bordered by a sandy beach as far as a hillock situated on the southern side of a lake which connects with a river, thence northward it consists of low sand dunes behind which is a wide plain. Cua Dai Giang (Kua Da Rang) lies about 10 miles north-westward of Nui Bai Gok, and is accessible to junks; a pagoda stands on a mound on its northern entrance point. Both entrance points are foul and a bank, with depths of less than 3 fathoms (5m5) over it, extends about 3 cables offshore. The bar is subject to change.

Between Cua Dai Giang and Mui Lang, about 16 miles northward, the coast is chiefly low and sandy, interspersed with rocky points and sandhills, with a few islets and rocks lying a short distance offshore. The plain within is well cultivated and is backed by a range of mountains, the most prominent of which are Nui Chap Chai, 1,279 feet (389m8) high, situated about 4¼ miles north-westward of Cua Dai Giang, and Nui Hon Chuong, 1,836 feet (559m6) high, about 6½ miles farther north-westward.

Îles Bai Ma Lieng lie on a rocky bank, with depths of less than 3 fathoms (5m5) over it, which extends 2 miles south-eastward from a rocky promontory situated about 6¾ miles north-north-westward of Cua Dai Giang. Île Coco, 43 feet (13m1) high, on which is an isolated coconut tree, lies near the outer end of the bank; some rocks above water lie close off the southern side of Île Coco. A rock, with a depth of 5¼ fathoms (9m6) over it, lies 6 cables south-south-eastward of Île Coco, and other rocks, with depths of 3 fathoms (5m5) and less over them, lie about half a mile south-eastward of the islet. Île Verte (*Lat. 13° 11′ N., Long. 109° 18′ E.*), 118 feet (36m0) high, bare and brown-coloured, except during the North-east monsoon, when there is a little verdure, lies nearly midway between Île Coco and the rocky point. The south-western side of Île Verte is fringed by a reef, and rocks extend a short distance from the south-eastern and north-eastern ends of the island. Some rocks, one of which is 3 feet (0m9) high, lie midway between Île Coco and Île Verte. A reef, 2 feet (0m6) high, lies about 6 cables northward of Île Verte, with rocks, which dry 2 feet (0m6), between it and the coast, and a rock, with a depth of 3 feet (0m9) over it, lies one mile northward of Île Verte and about half a mile offshore.

Phu Phong is a thriving village, situated in a clump of coconut trees, westward of the rocky promontory mentioned above.

Le Bonnet, a black islet, 223 feet (68m0) high, lies about 2¾ miles northward of Île Verte, connected by a reef to a projection which separates the sandy beaches on the coast.

Chart 3874.

Le Trapèze, a black and prominent rocky point, 370 feet (112m8) high, lies about 1¾ miles north-north-eastward of Le Bonnet. A reef, which is steep-to and on which is a rock, 3 feet (0m9) high, lies from 2 to 3 cables eastward of Le Trapèze.

Charts 2661a, 1263.

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Chart 3874.

Lao Ma Nha, a wooded island, 390 feet (118m9) high, lies about 1½ miles north-eastward of Le Trapèze, and 1¼ miles offshore. It is uninhabited, but frequented by fishermen from the neighbouring coast. A reef, which dries from 2 to 3 feet (0m6 to 0m9), extends about 1¼ cables from the western side of Lao Ma Nha and rocky ledges lie about the same distance off the other sides of the island in places. Ledges of rock extend about a quarter of a mile from the coast abreast Lao Ma Nha reducing the channel between to a width of about 5½ cables; during the summer months this channel is blocked by fishing nets.

The southern entrance of O Lang Dam, a lake, available for boats, is situated about 3 miles north-north-westward of Le Trapèze; its northern entrance lies about 2½ miles farther northward and about 6 cables westward of Mui Lang.

Phu Son, a village, situated in a small bay on the northern side of this entrance, has a considerable coasting trade with ports in Kwang-tung. There are numerous pagodas on this coast, and Nui Cot Cat, a table-topped hill, 330 feet (100m6) high, close northward of Phu Son, assists in distinguishing the bay.

Mui Lang is a black rocky bluff, bordered by a coral reef and isolated rocks. Mui Ganh Den, 252 feet (76m8) high and cultivated, lies about 1¾ miles northward of Mui Lang. Vung Chao is a small bight midway between these two points, and the coast on either side of the bight is bordered by detached rocks. A patch, with a depth of 2¾ fathoms (5m0) over it, lies about 4 cables north-eastward of Mui Lang.

Roche de l'Illissus, with a depth of 6 feet (1m8) over it, lies in the southern approach to Baie de Xuan Day, about 1½ miles south-eastward of Mui Ganh Den. The north-western extremity of Pulau Gambir (page 268), bearing 001° and just open eastward of Mui Mo O, leads eastward of Roche de l'Illissus; the south-western extremity of Lao Ong Xa (page 264), bearing 296° and open north-eastward of Mui Ganh Den (*Lat. 13° 22′ N., Long. 109° 17′ E.*) leads north-eastward of it.

Chart 1342.

Anchorages.—Vessels with local knowledge can anchor off Cua Dai Giang, in depths of about 9 fathoms (16m5), but the winds are fairly strong during the greater part of the year.

During the South-west monsoon anchorage can be obtained by vessels with local knowledge south-westward of Île Verte. During the North-east monsoon some shelter is given by Îles Bai Ma Lieng, but vessels are recommended not to anchor there in that season.

Chart 3874.

There is anchorage for vessels with local knowledge in the bay westward of Mui Lang.

Tidal streams.—In the entrance to O Long Dam the out-going stream on the falling tide may attain a rate of from 2 to 3 knots, and is fastest at half-tide. The in-going stream is weaker.

Approaches to Baie de Vung Chao.—Baie de Vung Chao, one of the most sheltered bays on the coast of Viet-Nam, but in which the depths are not greater than 27 feet (8m2), is approached through Baie de Xuan Day. The latter is entered between Mui Ganh Den and Mui Luoï Cay, the southern extremity of a peninsula which forms the eastern side of Baie de Vung Chao. The entrance of Baie de Xuan Day can be distinguished by the peaks on this peninsula, the high cliffs of Mui Mo O, about 4 miles north-north-eastward of Mui Luoï Cay,

Charts 2661a, 1263.

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Chart 3874.

and the hills around Mui Vung Trich, about 2¾ miles north-north-westward of Mui Mo O. Of the three peaks on the southern end of the peninsula, Vung Nie, the south-westernmost, is conical and 851 feet (259m4) high, and another about 2 miles east-north-eastward of Vung Nie is 1,172 feet (357m2) high. *See* view B on chart 1342.

The country around is cultivated. Numerous villages, surrounded by coconut trees, stand on the shores, which are backed by high ranges of hills.

Baie de Xuan Day.—Dangers.—Mui Da Tau lies about 1½ miles westward of Mui Ganh Den. Vung Xuan Day, a small shallow bay, is entered close westward of Mui Da Tau, and at its head is the narrow mouth of Rivière Xuan Day, which is obstructed by a bar, with depths of from 2 to 10 feet (0m6 to 3m0). The river is accessible to boats. The western entrance point of the river is the south-eastern end of a sandy spit extending from the sandhills which form the western side of Baie de Xuan Day as far as Mui Ganh Do, situated 2 miles north-westward of Mui Da Tau.

There is a Custom house at Mui Ganh Do.

On the northern side of Baie de Xuan Day, Mui Luoï Cay, a perpendicular cliff, 228 feet (69m5) high, is fronted by rocks above water close offshore. The eastern entrance point of Baie de Vung La, a shallow bay, is entered about half a mile north-westward of Mui Luoï Cay; Hon Mot lies close off the north-western entrance point of this bay, about a quarter of a mile farther north-westward. Northward of Hon Mot, there is a cove. A village stands on the eastern shore of the bay, which is fronted by rocks, both above and below water, extending nearly one cable offshore.

Between Hon Mot and Mui Ganh Tuong, about 1¼ miles westward, there are a few rocks above water lying close offshore. A peak, 490 feet (149m4) high, lies about half a mile east-north-eastward of Mui Ganh Tuong, and a short distance inland.

Hon Yen (*Lat. 13° 23′ N., Long. 109° 17′ E.*), 155 feet (47m2) high, formed of jagged red rocks, lies in the entrance of Baie de Xuan Day, about 1¼ miles north-westward of Mui Ganh Den. A bank, on which are some rocks above water lying close offshore, extends about 1½ cables from the north-eastern and south-western ends of the islet. Roche de l'Octant, with a depth of 5 feet (1m5) over it, lies about 6 cables west-south-westward of Hon Yen. A shoal, with a depth of 29 feet (8m8) over it, lies off the southern side of the bay, about a quarter of a mile northward of Mui Da Tau.

Vung Lam, a shallow bay, is entered between Mui Ganh Do and Mui Rung, about 1¼ miles west-north-westward; the southern side of Vung Lam is fringed by a drying bank which extends about a quarter of a mile offshore, and the head of the bay dries out for about 4 cables.

Lao Ong Xa, 172 feet (52m4) high and grey in colour, lies about 4 cables northward of Mui Ganh Do, near the north-eastern extremity of a ledge which extends from the southern side of Vung Lam. Rocks, the outer one of which dries about one foot (0m3), extend about one cable from the north-eastern end of Lao Ong Xa, and the ground between the islet and the mainland is foul.

About midway between Mui Rung and Mui Da Mai, one mile northward, the coast is fringed by a reef, extending about one cable offshore. Nui Lo Tra, 434 feet (132m3) high, lies midway between these two

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Chart 3874.

points, about 3 cables inland. Rade de Vung Lam is situated off this stretch of coast.

Roche du Volga, with a depth of 13 feet (4m0) over it, lies about half a mile north-north-eastward of Lao Ong Xa.

Roche Bouée, 2 feet (0m6) high, and steep-to, lies on the northern side of the fairway, about 4 cables westward of Mui Ganh Tuong.

Vung Chua, a small bay, lies about half a mile north-north-westward of Mui Ganh Tuong, and Dong Tranh lies about half a mile farther north-north-westward.

Between Mui Da Mai and Mui Mu U, about one mile north-north-eastward, there is a bay, near the middle of which is Hon Nhut Tu, which is connected to the coast by a drying bank, nearly 2 cables wide, dividing the bay into two portions. A drying bank extends about 2 cables from the head of the southern portion, and a reef fringes the northern shore of the northern portion. A few rocks lie close off Mui Mu U, and a rock, which dries one foot (0m3), lies about one cable offshore, a short distance southward of the point. A bank, with depths of less than 3 fathoms (5m5) over it, extends about 3½ cables offshore between Hon Nhut Tu and Mui Mu U.

Anchorages.—During the South-west monsoon, vessels can anchor with the mouth of Rivière Xuan Day, bearing 165°, and Hon Yen, 070°, in a depth of 6 fathoms (11m0). Approaching this anchorage through the channel southward of Hon Yen, the 29-foot (8m8) patch, which lies a quarter of a mile northward of Mui Da Tau, and also Roche de l'Octant should be avoided.

Vessels can anchor in Rade de Vung Lam about half a mile north-westward of Lao Ong Xa, in a depth of 5 fathoms (9m1), mud. In making this anchorage from eastward, Roche du Volga (*Lat. 13° 24′ N., Long. 109° 15′ E.*) and the rocks lying close off the north-eastern end of Lao Ong Xa should be avoided.

During the North-east monsoon vessels can obtain good anchorage off Baie de Vung La about 2 cables westward of the eastern entrance point, in depths of from 6½ to 8 fathoms (11m9 to 14m6), mud.

Tidal streams.—In the entrance to Baie de Xuan Day the flow attains a rate of 1½ knots, westward on the rising tide. Between this bay and Baie de Qui Nhon the flow is usually south-going off the coast.

Baie de Vung Chao.—Dangers.—Baie de Vung Chao, entered between Dong Tranh and Mui Mu U, about 1¼ miles westward, is only available for vessels of moderate draught, the depths over a considerable portion of the bay being from 3 to 4 fathoms (5m5 to 7m3); a bank, with depths of less than 3 fathoms (5m5) over it, extends about one mile from the western shore.

Song Cau, the principal village, stands on the western side of the bay on the northern side of the mouth of a river of the same name; it is the seat of the Resident of the province of Phu Yen; the Residency, a large building on the beach, is situated about 1¾ miles north-westward of Mui Mu U. An islet, fringed on its eastern side by a narrow drying bank, lies about 1½ cables off the river mouth. A small patch, which dries, lies close eastward of the Residency.

Two coral patches, the southern one of which dries less than one foot (0m3), and the other about 3 feet (0m9), lie about one mile and 1½ miles, respectively, north-eastward of the Residency, both about 4 cables offshore.

Charts 1342, 2661a, 1263.

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Chart 3874.

Hon Lo Dam Ca, a coral patch, which dries 5 feet (1m5), lies nearly 1½ miles northward of Dong Tranh.

On the south-eastern shore of the bay are the villages of Vung Su and Vung Chao, situated about 1¼ and 2 miles, respectively, north-eastward of Dong Tranh. Vung Chao village stands on the south-eastern side of a bay of the same name, entered between Mui Co Co and a point about three-quarters of a mile northward. A coral patch, which dries, lies in the northern part of this bay, about 6 cables northward of Mui Co Co.

Hon Lo Dam Nai, a detached coral patch, which dries 2 feet (0m6), lies about three-quarters of a mile north-westward of Mui Co Co.

The north-eastern side of Baie de Vung Chau is fringed by a reef, which dries, extending from 2½ to 5½ cables offshore. Hon Do, 83 feet (25m3) high, lies on the outer edge of this reef, nearly 2 miles north-westward of Hon Lo Dam Nai. A coral patch, which dries 2 feet (0m6), lies about a quarter of a mile southward of Hon Do, on the edge of the reef which fringes the north-eastern shore. Other detached coral patches, which dry from one to 2 feet (0m3 to 0m6), lie on the line joining Hon Lo Dam Nai and Hon Do.

Vung Quan So and Vung Bun, two shallow bays divided from one another by a peninsula, on which is a Custom house, lie in the north-western part of Baie de Vung Chao.

Anchorages.—Directions.—Vessels can anchor off Song Cau with the Residency bearing between 280° and 300°, in depths of between 3 and 3¼ fathoms (5m5 and 5m9), mud; or midway between Hon Lo Dam Ca and Mui Co Co, where the depths are greater.

Boats can land on the beach in front of Song Cau.

Having passed eastward of Roche de l'Illissus, a vessel should continue northward until Mui Da Mai bears 295°, when she should steer for it on that bearing, passing about half a mile north-eastward of Hon Yen, until the south-western extremity of that islet is in line with the eastern fall of the cliffs of Mui Ganh Den (not the eastern extremity of that point, as its limit varies with the height of the tide). This mark kept astern, bearing 141°, leads midway between Roche du Volga (*Lat. 13° 25′ N., Long. 109° 15′ E.*) and Roche Bouée. After passing these dangers course may be altered as convenient to pass midway between the entrance points and to the anchorage either eastward or westward of Hon Lo Dam Ca.

Port facilities.—Song Cau is connected to the general telegraph system. Small quantities of fresh provisions can be obtained.

Coast.—Between Mui Luoï Cay (page 263) and Hon Tai Ma, three-quarters of a mile north-eastward, there are two small bays, separated by a black bluff. Rocks, which dry about 5 feet (1m5), lie in the south-western bay, a short distance northward of Mui Luoï Cay and a rock above water lies close southward of Hon Tai Ma.

Hon Chai lies about 2 miles northward of Hon Tai Ma: a few rocks, some of which dry, lie close off the coast, in places between these two points.

Vung Mo O is entered between Hon Chai and the southern end of a hilly peninsula, of which Mui Mo O (page 263) is the north-eastern extremity. This peninsula is connected to the mainland by a sandy isthmus and has two peaks, each 654 feet (199m3) high. Rocks, some of which are above water, lie about one cable offshore, eastward of the southern peak.

Charts 1342, 2661a, 1263.

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Chart 3874.

Between this peninsula and Mui Vung Trich, about 2¼ miles north-north-westward, there is a sandy bay, backed by sandhills, about 120 feet (36m6) high, with a table-topped hill above them which is cultivated. Colline Verte, a hill, 513 feet (156m4) high, lies about 1¼ miles south-westward of Mui Vung Trich, a short distance inland. The southern end of the sandy bay is named Vung Quan and the northern end, Vung Trich.

Mui Vung Trich is the southern end of a peninsula, 372 feet (113m4) high, joined to the mainland by a narrow isthmus of sand. Mep Cua Duoï, the northern extremity of the peninsula, lies about 1½ miles north-north-westward of Mui Vung Trich. A spit, with a depth of 8 feet (2m4) over it, extends about 1¼ cables southward from Mui Vung Trich; the eastern side of the peninsula is bordered by rocks lying close offshore, the northernmost of which lie close off Mui Chau Sa, about one mile northward of Mui Vung Trich, and rocks extend about half a cable from Mep Cua Duoï.

Anchorages.—During the North-east monsoon temporary anchorage can be found in Vung Mo O, but the anchorage is not recommended as the swell is felt, the depths decrease rapidly, and the holding ground is bad.

During the South-west monsoon vessels can anchor in Vung Trich between 2 and 3 cables offshore, in depths of from 2¾ to 5 fathoms (5m0 to 9m1).

Baie de Cu Mong.—Dangers.—Baie de Cu Mong is entered between Mep Cua Duoï and Mep Cua Tren, about a quarter of a mile westward. Rocks, both above and below water, the outermost of which dries about 2 feet (0m6), extend about one cable east-south-eastward from Mep Cua Tren. A bank, with depths of 9 feet (2m7) over it, extends about half a cable from the eastern side of the entrance, leaving a channel about three-quarters of a cable wide. The entrance can be identified when approaching from northward by Colline Verte (*Lat. 13° 30′ N., Long. 109° 17′ E.*) which has a notch on its rocky summit. There are depths of 6 fathoms (11m0) in the entrance, becoming less a short distance within. The shores of the bay are densely populated and bordered by coconut trees.

The eastern side of the bay is fringed by a bank, which dries, extending about one cable offshore. The village of Vinh Hoa stands in a group of palms on the isthmus at the south-eastern end of the bay. During a typhoon, in 1924, a breach about one cable wide, with a depth of 5 feet (1m5) over it, was made in this isthmus, rendering the anchorage unsafe at that time. On the western side of the bay there is a small bight with a sandy beach.

Hon Nan lies near the middle of the bay, about 1¼ miles west-south-westward of Mep Cua Duoï, on the outer edge of a shallow bank which extends about half a mile from the north-eastern shore of the bay. There is a Custom house on the north-eastern shore, northward of Hon Nan.

The north-western part of the bay is shallow and dries in places as much as 3 feet (0m9). In the middle of the northern part of the bay is Con Guia, a shoal, which dries 2 feet (0m6).

The northern end of Baie de Cu Mong leads into a large lagoon, available for small craft with local knowledge.

Anchorage.—Directions.—There is good anchorage for small

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Chart 3874.

vessels in Baie de Cu Mong about 7 cables south-south-westward of Mep Cua Tren, in a depth of $2\frac{3}{4}$ fathoms (5^m0), mud.

Approaching the bay, a vessel should steer with the notch on Colline Verte, bearing 187°, until the rocks south-eastward of Mep Cua Tren have been passed; course can then be altered for the anchorage. The flow at times sets strongly in a south-easterly direction across the entrance.

Coast.—Between Mep Cua Tren and Mui Ke Ga, about $2\frac{1}{2}$ miles north-north-eastward, there is a bay, the shore of which is composed of sandy beaches separated by hilly promontories.

Mui Ke Ga, which rises to an elevation of 356 feet (108^m5) a short distance inland, is the south-eastern extremity of a small peninsula, on either side of which is a small bay, connected to the mainland by a low isthmus, about a quarter of a mile wide; Mui Vung Mu, the north-western extremity of the peninsula, lies about three-quarters of a mile from Mui Ke Ga. A few rocks above water lie close off the latter point.

Hon Kho lies about $1\frac{1}{4}$ cables northward of Mui Vung Mu, with rocks, both above water and sunken, extending over one cable farther northward.

The village of Tuy Lang is situated at the head of Vung Mu, the small bay westward of Mui Vung Mu. There is anchorage northward of this bay, in a depth of 10 fathoms (18^m3); vessels approaching the anchorage should give Hon Kho a wide berth.

For about $5\frac{1}{2}$ miles north-westward of Mui Vung Mu the coast consists of sandhills forming the eastern side of the lagoon northward of Baie de Cu Mong. Nui Yen Beo, 1,100 feet (335^m3) high and having a conical summit, lies about $3\frac{1}{2}$ miles westward of Mui Ke Ga (*Lat. 13° 34′ N., Long. 109° 18′ E.*).

Off-lying island and dangers.—Light.—Pulau Gambir, with two summits, the tops of which are bare, lies about 4 miles north-eastward of Mui Ke Ga. The north-western hill is 425 feet (129^m5) high and the lighthouse stands on the eastern hill. *See* view facing page 261.

A rock, with a depth of less than one foot (0^m3) over it, lies about $6\frac{1}{2}$ cables westward of the southern extremity of the island and about half a mile offshore; between this rock and the coast northward, there is a reef on which some of the rocks are above water.

Two rocks, above water, lie close off the southern extremity, and a rock, with a depth of less than 6 feet (1^m8) over it, lies about $6\frac{1}{2}$ cables east-south-eastward of the northern extremity of the island.

There is a small bay on the south-western side of the island, at the head of which is the village of Tanh Chau.

A light is exhibited, at an elevation of 387 feet (118^m0), from a grey truncated tower with a white band, about 52 feet (15^m8) in height, on the eastern side of Pulau Gambir.

Les Mamelles, two sharp-peaked rocks, one of which is 123 feet (37^m5) high, lie about three-quarters of a mile south-south-eastward of Pulau Gambir. Another rock lies close southward of Les Mamelles, and there is a depth of 17 feet (5^m2) about one cable southward of this rock.

Banc de Pâques, composed of coral, with a least depth of 25 feet (7^m6) over it, lies about 2 miles westward of the southern extremity of Pulau Gambir; there is a clear passage on either side of this bank.

Charts 1342, 2661a, 1263.

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Chart 3874.

Tidal streams.—In the vicinity of Pulau Gambir the flow is usually southward and follows approximately the 50-fathom (91m4) line. It ceases only after periods of fresh southerly winds. The island causes the general south-going flow to divide. The western branch sets at a rate of from 1½ to 2 knots through the channel between Banc de Pâques and Pulau Gambir; it then turns westward and northward along the coast from Hon Tai Ma, situated about one mile north-eastward of Mui Luoï Cay, to Hon Roi at gradually diminishing speed.

Approaches to Baie de Qui-Nhon.—Dangers.—A bank, with depths of from 59 to 65 feet (18m0 to 19m8) over it, lies about 2½ miles north-north-westward of Pulau Gambir. Hon Kho, with a depth of 23 feet (7m0) over it, lies about 2½ miles farther northward.

Rochers de la Tortue, a group of rocks with foul ground extending about 1½ cables westward from them, lie about 6¼ miles north-north-westward of Mui Vung Mu and about 3½ cables offshore.

Hon Dat, 244 feet (74m4) high and covered with brushwood, lies on the western side of the approach, about one mile north-eastward of Rochers de la Tortue and one mile offshore. Hon Roi, 185 feet (56m4) high and connected to the mainland by a shallow ridge, lies about 6 cables westward of Hon Dat, the channel between them being obstructed by a reef on which one of the rocks is 19 feet (5m8) high.

Rochers du Crabe, 18 feet (5m5) high, surrounded by a reef, lie half a mile northward of Hon Roi.

Between a point on the mainland, about 1½ miles southward of Rochers de la Tortue, and a point about 4 miles northward the coast is steep and mountainous, with rocks, both above water and sunken, lying close offshore. Northward of the last-mentioned point, for about one mile, the coast consists of a sandy beach backed by sandhills.

Chart 264, plan of Port de Qui-Nhon.

Close northward of these sandhills and 3½ cables inland there is a hill, 779 feet (237m4) high; thence to Pointe de Gia, the northern entrance point of Baie de Qui-Nhon, about 2½ miles north-eastward, there is a bay, the shore of which is low and sandy. A bank, with depths of less than 3 fathoms (5m5) over it, extends 1¼ miles from the north-western side of this bay.

The town of Qui-Nhon stands on a sandspit which forms the northern shore of this bay and the south-western shore of Baie de Qui-Nhon.

A bank, which dries about 3 feet (0m9), extends about 3 cables westward and 1½ cables southward from Pointe de Gia (*Lat. 13° 46′ N., Long. 109° 15′ E.*). There are depths of 1¼ fathoms (2m3) about three-quarters of a mile south-south-westward of the same point.

Nui Deo Son, 933 feet (284m4) high, lies about 2½ miles west-north-westward of Pointe de Gia, and about 1¼ miles inland.

On the eastern side of the approach, Mui Yen, a rocky bluff at the south-eastern end of Presqu'île de Phuoc Mai, lies about 2¼ miles east-south-eastward of Pointe de Gia. Culao Hon Kho, an island connected to the coast by a reef, lies about three-quarters of a mile north-eastward of Mui Yen. *See* view on plan.

Baie de Lang Mai, the north-western shore of which consists of a sandy beach backed by sandhills, lies between Mui Yen and a point about one mile westward; Pointe Sud, the southern entrance point of Baie de Qui-Nhon, lies about 1¼ miles farther westward. A shoal,

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Chart 3874.

Presqu'île de Phuoc Mai, 1,182 feet (360m3) high, lies about 2½ miles northward of this gap. The point at the northern end of this stretch of coast is the southern end of a promontory, 313 feet (95m4) high and rocky; some rocks, above water, lie close off the northern end of this promontory.

Charts 3874, 1342.

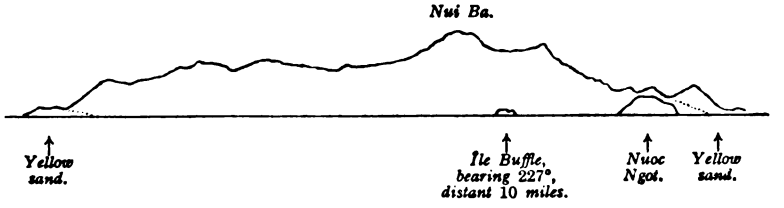
Between the latter point and a rocky promontory, 205 feet (62m5) high, about 4½ miles north-north-westward, there is a bay, the shore of which is backed by sandhills. The village of Hung Luong stands at the southern end of this bay. A bank, with a depth of 4½ fathoms (8m2) over its outer end, extends about 4 cables eastward from the rocky promontory.

Chart 1342.

Le Cône, a prominent hill on the coast, 716 feet (218m2) high, lies about 1½ miles northward of the rocky promontory, midway between two small bays. Thanh Hi (Vung Tang), the northern entrance point of the northern of these two bays, is 618 feet (188m4) high, and lies 1½ miles northward of Le Cône (*Lat. 14° 00′ N., Long. 109° 14′ E.*).

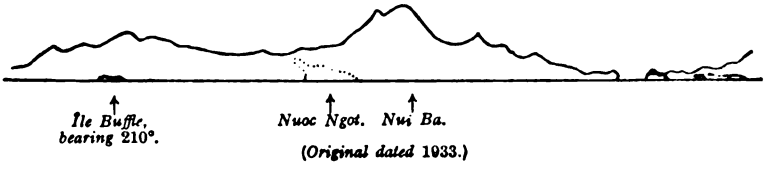
Nuoc (Nuok) Ngot, a steep promontory, 523 feet (159m4) high, with several red granite peaks, rendered prominent by the patches of sand on their slopes, lies about 7 miles northward of Thanh Hi. This promontory is the southern end of a peninsula which forms the eastern side of Baie de Nuoc Ngot and the entrance to which is at the southern end of the peninsula. Southward of Nuoc Ngot there is a bay, the western shore of which is backed by sandhills.

Nuoc Ngot, bearing 292°, distant 15 miles.
(*Original dated* 1933.)



(*Original dated* 1933.)

Hon Heo, the summit of which is 2,193 feet (668m4) high and flat, with an isolated rock on it, lies about 3 miles westward of Thanh Hi. Nui Ba, 2,925 feet (891m5) high, also with an isolated rock on it, lies about 5 miles west-north-westward of Hon Heo.



(*Original dated* 1933.)

Charts 2661a, 1263.

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Chart 1342.

Anchorages.—During southerly winds shelter may be obtained by vessels with local knowledge off Hung Luong (chart 3874). Vessels with local knowledge can anchor in the bay southward of Nuoc Ngot (*Lat. 14° 08′ N., Long. 109° 13′ E.*), in depths of from 8 to 10 fathoms (14^{m}6 to 18^{m}3).

Tidal streams.—Between Mui Yen and Cap Bantan (page 275) the flow is generally south-going except during the South-west monsoon when it is weak and irregular. Between Nui Ong Co and the mainland its average rate is about one knot.

Chart 3874.

Off-lying islets and dangers.—Nghiem Kinh Chieu, an islet, 178 feet (54^{m}2) high, with another islet close northward of it, lies about a quarter of a mile eastward of the southern end of the 313-foot (95^{m}4) promontory (page 272). Rocks, above water, lie close off the southern end of Nghiem Kinh Chieu and others lie close off its south-western and south-eastern sides.

Nui Ong Co, 316 feet (96^{m}3) high, is a precipitous pyramidal rock lying about 1½ miles east-north-eastward of the northern end of the 313-foot (95^{m}4) promontory. Nui Ong Can, a small group of islets, the north-eastern of which is 251 feet (76^{m}5) high, lies about 1¾ miles eastward of Nui Ong Co. There is a rocky patch, with a depth of 4 fathoms (7^{m}3) over it, about 4 cables westward of Nui Ong Can.

Chart 1342.

Île Buffle (Buffalo) is a barren granite islet, 103 feet (31^{m}4) high, lying about 3¾ miles eastward of Nuoc Ngot. Two rocks, above water, lie about 2 cables eastward of Île Buffle, with a rock, on which the sea breaks, between them and the islet.

Coast.—Dangers.—Light.—Northward of Nuoc Ngot the coast is low and backed by isolated sandhills. Vung Moi (Moe), a small bay, in which is a village, lies at the termination of these sandhills, close westward of a steep cliff, situated about 6 miles northward of Nuoc Ngot. A rock, with a depth of 6 feet (1^{m}8) over it, lies about 6½ cables southward of the northern entrance point of Vung Moi.

A ridge, on which is Îlot Nuoc, lying close offshore, and Rocher Plat, which dries 7 feet (2^{m}1) at its outer end, extends about three-quarters of a mile eastward from the northern end of the steep cliff.

Île Nuoc (Nuok), 149 feet (45^{m}4) high with two peaks, is the largest and north-easternmost of a group of black rocky islets, and lies about one mile northward of Rocher Plat; it is fringed by rocks which extend about one cable from its north-eastern side. A bank, with a depth of 2¾ fathoms (5^{m}0) over it, extends about 2 cables from the northern end of the islet. Between the islet and the mainland there are several rocks above water.

A light is exhibited, at an elevation of 167 feet (50^{m}9), from a white house, about 18 feet (5^{m}5) high, on the coast about 1½ miles northward of the northern entrance point of Vung Moi (*Lat. 14° 13′ N., Long. 109° 11′ E.*).

About 5 miles west-south-westward of Vung Moi light-structure are two peaks, the eastern of which is Tête Ronde (Round Top), 1,983 feet (604^{m}4) high, with a rounded summit.

There is a rocky point, 169 feet (51^{m}5) high, about 2 miles northward of Vung Moi light-structure, and foul ground extends about

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Chart 1342.

4 cables south-eastward from the point. Between this point and the village of Phu Tu, about 7 miles north-north-westward, the coast consists of a sandy beach backed by sandhills, close inland of which is a lake, named Dam Tra O. From a point about one mile northward of Phu Tu some sunken rocks extend about half a cable.

About 4 miles northward of Phu Tu is Pointe An Yo, the northern of two rocky spurs which extend from a chain of mountains, the summit of which, Nui Chop Chai, is 2,137 feet (651m4) high, situated about 5 miles south-south-westward of the point. About one mile southward of Pointe An Yo a reef extends about a quarter of a mile south-eastward. A rock, with a depth of 7 feet (2m1) over it, lies about half a mile eastward of Pointe An Yo.

Off-lying islet.—Île Tortue, a black islet, 32 feet (9m8) high, with a reef extending a short distance from its eastern side, lies about 6½ miles northward of Île Nuoc, and 3½ miles offshore.

Anchorages.—During the South-west monsoon, there is good anchorage for vessels with local knowledge under the lee of the Nuoc group of islets, in a depth of about 8 fathoms (14m6). Making the anchorage, a vessel should pass about one mile northward of Île Nuoc in order to avoid the dangers off it.

Coast.—Between Pointe An Yo and Pointe de Kim Bong (Tamkwam), about 8½ miles north-north-westward, the coast is sandy. About 4 miles north-north-westward of Pointe An Yo, the Song Lai Giang discharges through Lagune d'An Gai, near which is a village surrounded by palms. Nui Kho, which has a red summit, 733 feet (223m4) high, lies about 4 miles north-westward of Pointe An Yo and about 2 miles inland.

The narrow mouth of Song Tam Quan is situated about half a mile westward of Pointe de Kim Bong. A bank, with depths of less than one foot (0m3) over it, extends about a quarter of a mile eastward from the southern entrance point of the river. On the northern side of the entrance there is a pagoda, standing on a low hill. Between the pagoda and Pointe de Kim Bong there is a small bay. A bank, with a depth of 3½ fathoms (6m4) over it, lies about a quarter of a mile southward of the point, and shoals, with depths of 2½ and 2¾ fathoms (4m6 and 5m0) over them, lie about three-quarters of a mile north-north-eastward and eastward, respectively, of the same point. Tam Quan village, surrounded by plantations of coconut palms and areca nuts, stands about one mile within the entrance of the river; some provisions can be obtained from the village.

Between Pointe de Kim Bong and Cap Sa Hoi, 303 feet (92m4) high, 5½ miles northward, the coast consists alternately of rocky points and sandy bays. Cap Sa Hoi (*Lat. 14° 40′ N., Long. 109° 05′ E.*) is the southern end of a peninsula about one mile long, enclosing a lagoon. There is a Custom house on the cape. The village of Sa Huynh stands on the mainland close westward.

Between Cap Sa Hoi and Cap Batangan, about 35 miles northward, the coast is backed by sandhills of which only two are prominent; one, 579 feet (176m5) high, situated a short distance inland from Cap Mia, which lies about 10½ miles north-north-westward of Cap Sa Hoi; the other, Nui Diep, 211 feet (64m3) high and wooded, lies about 13 miles north-north-westward of Cap Mia and 1½ miles inland. The interior of the country is mountainous.

Charts 2661a, 1263.

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Chart 1342.

A river discharges close northward of Cap Mia and rocks extend a short distance north-eastward from the cape.

Some rocks above water lie close to the beach at the foot of a hill, 247 feet (75m3) high, situated about 2 miles north-eastward of Nui Diep. Northward of these rocks a bank which extends about three-quarters of a mile offshore, with depths of less than 5 fathoms (9m1) over it, fringes the coast as far as Cap Batangan. Rocher Noir (Black rock) lies near the edge of this bank, 5½ miles northward of Nui Diep.

Song Tra Khuc (Kuch) discharges about 2¾ miles northward of Rocher Noir. Between the mouth of this river and the mouth of Rivière de Sa Ky (Sa Ki), about 4 miles north-north-eastward, there is a shallow bay.

Cap Batangan, 113 feet (34m4) high, is fringed on its northern side by a reef and rocks, both above and below water, which extend about 6 cables offshore. Rocher Plat (Flat rock), just above high water, lies about 3¼ miles south-south-eastward of the northern extremity of Cap Batangan and about 1¾ miles offshore. Two detached rocks, with depths of 1½ and 4½ fathoms (2m7 and 7m8) over them, lie about 1¼ miles and one mile, respectively, north-north-westward of Rocher Plat. Vessels should give Cap Batangan a wide berth.

Between Cap Batangan and Pointe de Go Nhan, about 6 miles north-westward, there is a sandy bay, the western and northern shores of which are fringed by reef. A rock, with a depth of 2 fathoms (3m7) over it, lies about half a mile southward of Pointe de Go Nhan, about 3½ cables offshore, and there is a 5-foot (1m5) patch about midway between it and the coast westward. Pointe de Go Nhan is fringed by a reef, which extends about 1½ cables offshore.

Baie de Nho-Na is entered between Pointe de Go Nhan and Pointe de Phuoc Thien, 70 feet (21m3) high, about 1½ miles north-westward. The southern side of the bay is fringed by a reef which extends about 3½ cables offshore, and a bank, with depths of less than 5 fathoms (9m1) over it, extends half a mile from the head of the bay. The northern side of Pointe de Phuoc Thien is fringed by a reef extending about 1½ cables offshore.

Baie de Viet Thanh is entered between Pointe de Phuoc Thien and a point about 3½ miles north-westward. A bank, with depths of less than 5 fathoms (9m1) over it, extends about a quarter of a mile from the south-western shore of the bay, and there is a rock, with a depth of 2½ fathoms (4m6) over it, lying on the outer edge of the bank about three-quarters of a mile westward of Pointe de Phuoc Thien.

Chart 1342, plan of Dung Kwat bay.

Between the north-western entrance point of Baie de Viet Thanh and Cap Bantan (*Lat. 15° 25′ N., Long. 108° 49′ E.*), about 1¼ miles north-north-westward, there is a bay fringed by reefs in places, and in which there are some sunken rocks lying about 1¼ cables offshore. A 2½-fathom (4m6) patch lies about 3½ cables north-westward of the southern entrance point of the bay and about 2 cables offshore.

Cap Bantan is a hilly projection, 464 feet (141m4) high; between the cape and Pointe Intérieure, about 1½ miles west-north-westward, there is a bay, the shores of which are fronted by a rocky bank, with depths of less than 5 fathoms (9m1) over it, extending about 3 cables offshore; a patch, which dries 3 feet (0m9), lies on the bank about 6 cables south-eastward of Pointe Intérieure.

Charts 2661a, 1263.

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Chart 1342.

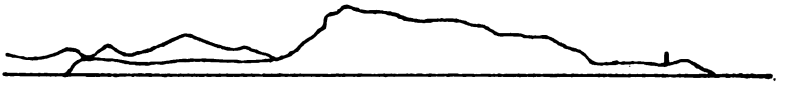
Anchorages.—Vessels with local knowledge can anchor off the mouth of Song Lai Giang, in depths of from 7 to 8 fathoms (12m8 to 14m6), sand.

Vessels with local knowledge can anchor off the mouth of Song Tam Quan, in depths of 7 fathoms (12m8), sand and mud. This anchorage is partly sheltered from northerly winds by Pointe de Kim Bong.

During the South-west monsoon, there is good anchorage for vessels with local knowledge in the bay northward of Cap Batangan, with the rocks off the cape bearing 090°, in a depth of 5½ fathoms (10m1), or farther north-westward, in a depth of 6½ fathoms (11m9).

During the South-west monsoon, vessels with local knowledge can anchor in either Baie de Nho-Na or Baie de Viet Thanh.

Off-lying islands and banks.—Light.—Dangers.—Culao Ré (Kulao Rai), an island lying about 15½ miles east-south-eastward of Cap Bantan, is formed of several craters and peaks which appear isolated when seen at a distance of 25 miles, except on a northerly bearing, when the island has a level aspect. The eastern and highest peak is 589 feet (179m5) high.



(*Original dated* 1933.)

A light is exhibited, at an elevation of 172 feet (52m4), from a black pyramidal steel tower with a white band, about 164 feet (50m0) in height, on the north-eastern extremity of Culao Ré.

Culao Ré is fringed by a coral reef which extends about 6½ cables west-north-westward from its western extremity, and about one mile south-eastward from its eastern end. A rocky reef, over which there are overfalls, extends about 3 miles from the northern side of the island. There are some villages on the island, and it is cultivated.

The holding ground off the island is rocky and bad everywhere, but temporary anchorage can be found southward of the summit; during the South-west monsoon, the best anchorage is northward of the westernmost peak, where the sea is not felt.

Culao Bo Baï (North island), an island, 109 feet (33m2) high and rocky, lies about 2½ miles north-north-westward of Culao Ré. It is fringed by a coral reef, outside which there is a bank, with a depth of less than 5 fathoms (9m1) over it, extending about 3 cables offshore.

Banc du Volta, with a least depth of 1¼ fathoms (2m3) over it, and on which the sea frequently breaks, lies about 6½ miles north-westward of Culao Bo Baï. The bank is frequented by fishermen during the South-west monsoon.

Chart 1342, plan of Dung Kwat bay.

Baie de Dung Quat.—Dangers.—Baie de Dung Quat (Kwat) is entered between Pointe Intérieure (*Lat. 15° 26′ N., Long. 108° 48′ E.*) and Pointe Happoix, 9 miles north-westward. *See* view facing page 279.

Rocks, one of which dries 2 feet (0m6), lie close off Pointe Intérieure,

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Chart 1342, plan of Dung Kwat bay.

and a 2¼-fathom (4m1) rocky patch lies 2½ cables north-north-westward of the point. On the eastern side of the bay a shoal, on which are some rocks, above water, lies close offshore, with its northern end about 3 cables south-south-westward of Pointe Intérieure. South-eastward of this shoal the shore is fringed by rocks as far as the northern entrance point of Song Moi, situated at the eastern end of the bay, about one mile south-south-eastward of Pointe Intérieure.

On the western side of Baie de Dung Quat, Pointe Happoix, 136 feet (41m4) high, is the northern extremity of a projection. Baie de An-Hoa lies between Pointe Happoix and a point, on which there is a Custom house, about 1¼ miles southward. The shore of this bay, southward of Pointe Happoix, consists of sandhills and all the northern part of the bay is shallow. Islets and rocks, both above water and sunken, extend about one mile south-eastward from Pointe Happoix. Rivière de An-Hoa discharges into the southern end of this bay.

The southern entrance point of Baie de An-Hoa is fringed by a narrow reef, and shoal patches, with depths of 2¼ fathoms (4m1) over them, lie about half a mile northward and north-eastward of it. Between this point and a point about 2½ miles south-south-eastward, the shore of Baie de Dung Quat is hilly and bordered by rocks, some of which lie nearly a quarter of a mile offshore; a rock, which dries 3 feet (0m9), lies close off the last mentioned point. The village of Thanh-Tra is situated at the foot of a hill westward of this rock.

The remainder of the shore of Baie de Dung Quat is sandy and is fringed by a bank, over which the depths are less than 3 fathoms (5m5), extending half a mile offshore in places.

The mouth of Song Tra Bong is situated at the head of the bay, about 2½ miles south-south-westward of Pointe Intérieure; several rocky islets and rocks, both above water and sunken, lie off its mouth, but vessels drawing 6 feet (1m8) can enter at high water and anchor off the Custom house situated on the eastern bank, about half a mile within.

Inland, the country is mountainous; Nui Chua (chart 1342), 4,466 feet (1,361m2) high, lies about 14 miles south-westward of Pointe Happoix. *See* view facing page 279.

Off-lying bank.—Banc de Kikuik, composed of rock, with a least depth of 9 fathoms (16m5) over it, lies in the approach to Baie de Dung Quat, about 3¼ miles north-westward of Pointe Intérieure.

Anchorages.—During the South-west monsoon, good anchorage can be obtained in the south-eastern part of Baie de Dung Quat. Large vessels should anchor south-westward of Pointe Intérieure, in a depth of about 9 fathoms (16m5); small vessels can anchor nearer the shore, in depths of from 3 to 4 fathoms (5m5 to 7m3). Vessels can also anchor during the South-west monsoon, off Thanh-Tra, about three-quarters of a mile offshore, in a depth of 6 fathoms (11m0), sand.

Chart 1342.

Coast.—A ledge of rocks, with a depth of one fathom (1m8) over it, lies about one mile west-north-westward of Pointe Happoix (*Lat. 15° 31′ N., Long. 108° 40′ E.*), and another ledge, with a depth of less than one foot (0m3) over it, lies about half a mile westward of the same point. The sea sometimes breaks on these ledges. There is a depth of 3¾ fathoms (6m9) about a quarter of a mile west-north-westward,

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Chart 1342.

and a depth of 3 fathoms (5m5) about 3 cables westward, of the outer ledge.

Between Pointe Happoix and the mouth of a river, about 3 miles westward, there is a small bay. The river mouth is connected by inland waterways with Rivière de Faï Fo (page 279). The mouth of the latter lies about 27 miles north-westward of Pointe Happoix, several villages being situated along the coast between them.

In the interior are several high mountain ranges.

The coast is low for a distance of about 15 miles north-westward of Rivière de Faï Fo, where it is joined by the mountainous Presqu'île de Tien Sha (page 279), forming a large bay. Montagne de Marbre (Marble rock), 339 feet (103m3) high and prominent, lies 10 miles north-westward of the mouth of Rivière de Faï Fo, close to the coast. *See* view A on chart.

Off-lying islands and dangers.—Hon Ong, about 656 feet (200m0) high and steep-to, lies about 18 miles northward of Pointe Happoix (*Lat. 15° 31′ N., Long. 108° 39′ E.*) and 14 miles offshore. *Chart 1010.*

Culao (Kulao) Cham, the largest of a group of islands lying about 5 miles off the mouth of Rivière de Faï Fo, is 1,698 feet (517m5) high, inhabited and cultivated, and lies about 11 miles north-westward of Hong Ong. *See* view A on chart 1342.

Culao Cham, bearing 255°, distant about 45 miles.

Presqu'île de Tien Sha, bearing 270°.

(Original dated 1933.)

There is a bay on the south-western side of Culao Cham, entered about 2¼ miles north-westward of its south-eastern extremity. The village of Tan Hop Phuong stands at the head of the bay; close southward of the village is a watering place, close off which are two rocks.

Some rocks lie close north-westward of the western extremity of Culao Cham; and Hon Nhan lies about one cable off its northern extremity. The north-western and north-eastern sides of the island are steep; on its eastern side, a few rocks lie close offshore.

Hon Tai, 739 feet (225m3) high, lies about half a mile southward of the south-eastern extremity of Culao Cham. Roche du d'Entrecasteaux, with a least depth of 14 feet (4m3) over it, lies about 8 cables west-south-westward of Hon Tai. Hon Co, bearing more than 311°, and open south-westward of Hon Mo, leads south-westward of this rock.

Hon Giai, 238 feet (72m5) high, is separated from the north-western end of Culao Cham by a deep channel about 6 cables wide. A bank, with depths of less than 6 fathoms (11m0) over it, lies from about 1½ cables to 1¼ miles south-eastward of Hon Giai. The least depth over this bank, 20 feet (6m1), is situated near the middle of its north-eastern side.

Hon Mo, 195 feet (59m4) high, lies about 3¾ cables south-south-westward of Hon Giai. A bank, with depths of less than 6 fathoms

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To face page 279.

Cap Bantan, *Baie de Dung Quat.* *Cone.* *Nui Chua.*
bearing 200°, *distant about* 15 *miles.*

Approach to Baie de Dung Quat from north-eastward.

(*Original dated* 1865.)

Cap Tourane, *Presqu'ile de Tien Sha.* *Baie de Tourane.* *Culao Han,* *Cape Chon May,*
bearing 156°. *bearing* 249°, *distant about* 4 *miles.* *bearing* 286°.

Approach to Baie de Tourane from north-eastward.

Culao Han. *Cap Chon May Est,* *Cap Chon May Ouest.* *Three summits.* *Numerous Pagodas along the coast.*
bearing 130°, *distant about* 7 *miles.*

Coast north-westward of Cap Chon May Est.

(*Originals dated* 1831.)

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Chart 1010.

(11m0) over it, extends about three-quarters of a mile south-eastward from Hon Mo.

Hon La, 523 feet (159m4) high, lies about 2 miles west-north-westward of the western extremity of Culao Cham.

Hon Co (Ko), 192 feet (58m5) high, and Hon Cu (Ku) lie about one mile and 1½ miles, respectively, westward of Hon La (*Lat. 15° 58′ N., Long. 108° 27′ E.*).

The depths between these islands and the mainland south-westward are irregular; there are patches of 5 and 6 fathoms (9m1 and 11m0) in several places, the positions of which can best be seen on the chart.

Currents.—The currents are feeble and irregular; that during the South-west monsoon is scarcely felt.

Anchorages.—During the North-east monsoon, anchorage with good shelter may be obtained in the bay on the south-western side of Culao Cham, off Tan Hop Phuong, in depths of from 4 to 4½ fathoms (7m3 to 8m2), sand and mud, with good holding ground; greater depths will be found outside the line joining the entrance points.

Small craft can anchor on the bank south-eastward of Hon Giai. Vessels can also anchor south-eastward of this bank, with the western extremity of Culao Cham bearing 346° and the southern extremity, 090°.

Rivière de Faï Fo.—Cua (Kua) Dai, the mouth of Rivière de Faï Fo, lies between Pointe de An Luong, a low and sandy point, and Pointe de Cua (Kua) Dai, which is higher, about one mile north-westward; there is a Custom house on the latter point. A narrow sandbank, above water, lies close off Pointe de Cua Dai and extends in a curve about one mile eastward. Southward of this bank, Cua Dai is fronted by a bar, which is about one mile wide; there is a channel through it, in which there is a depth of about 5 feet (1m5), but it is subject to frequent changes.

Vessels can anchor outside the bar, in depths of from 8 to 10 fathoms (14m6 to 18m3), but the holding ground is bad. The masts of junks, anchored inside the bar, are visible from seaward.

Rivière de Faï Fo is connected by inland waterways with Baie de Tourane (page 280).

Chart 1342, with plan of Tourane bay.

Presqu'île de Tien Sha.—Light.—Signal station.—Cap Tourane is the eastern extremity of Presqu'île de Tien Sha, and lies about 15 miles northward of Pointe de An Luong. The peninsula attains an elevation of 2,272 feet (692m5) near its centre, and 2,022 feet (616m3) near its north-western end. It is joined to the mainland by a low isthmus. *See* view facing this page and view A on chart 1342.

Chart 1342.

On the southern side of the peninsula, there is a bay between Cap Tourane (*Lat. 16° 07′ N., Long. 108° 20′ E.*) and Pointe du Lutin, about 2 miles south-westward. Baie du Lutin is entered between Pointe du Lutin and Pointe de la Comète, about 1½ miles westward. The bay is fringed by a bank, with depths of less than 3 fathoms (5m5) over it, extending about one cable offshore.

Between Pointe de la Comète and a point about 6 cables westward, the coast is fringed by a rocky bank, which extends one cable offshore in places. Baie du Rocher Noir is entered between the latter point and the coast, about one mile westward. Rocher Noir, above water, with a patch of coral, which dries, about one cable westward of it,

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Chart 1342.

lies on a shoal situated outside the entrance of the bay, about half a mile south-westward of its eastern entrance point. There is a 1½-fathom (2m3) rocky patch about 2½ cables north-north-westward of Rocher Noir; northward of this patch the depths decrease regularly towards the head of the bay.

A light is exhibited, at an elevation of 518 feet (157m9), from a white circular masonry tower, about 29 feet (8m8) in height, on the eastern side of Presqu'île de Tien Sha, about 1½ miles north-north-westward of Cap Tourane.

During the North-east monsoon this light is liable to be obscured by clouds.

There is a signal station near the lighthouse with which vessels can communicate by means of the International Code of Signals.

Storm signals are shown, *see* page 18.

The eastern side of Presqu'île de Tien Sha is steep-to. Between a point about 2 miles north-westward of Cap Tourane and the northern extremity of the peninsula, about 4 miles westward, the northern side is indented by two bays.

Anchorages.—There is sheltered anchorage for vessels with local knowledge in Baie du Lutin, in depths of from 6 to 6½ fathoms (11m0 to 11m9), mud, with Pointe du Lutin in line with the summit of Culao Cham, bearing about 124°.

Vessels with local knowledge can also anchor in Baie du Rocher Noir.

Chart 1342, plans of Tourane bay and Port Tourane.

BAIE DE TOURANE.—Dangers.—Buoy.—Lights.—Baie de Tourane is entered between the northern extremity of Presqu'île de Tien Sha and a point about 4 miles north-westward. It can be identified by the high land of Presqu'île de Tien Sha and by Culao (Kulao) Han, an island, 726 feet (221m3) high and cliffy, which lies about 3 cables north-eastward of the north-western entrance point of the bay, separated from the latter by a channel, in the fairway of which is a depth of 13 fathoms (23m8). A patch, with a depth of 4 feet (1m2) over it, lies on the north-eastern side of this channel, about three-quarters of a cable from the south-western side of the island. The eastern side of the island is steep-to.

Roche Canton lies about 3 cables north-westward of the south-eastern entrance point of Baie de Tourane. The rock has two heads, the northern of which dries about 2 feet (0m6), and the southern, close south-eastward, has a depth over it of one foot (0m3). Vessels should pass northward and westward of Roche Canton, which is generally visible and is marked by a black conical buoy, surmounted by a ball, on its north-western side.

Phare de l'Observatoire (North Fort lighthouse), bearing less than 211° and open of a projection on the north-western side of Presqu'île de Tien Sha, or the light in sight at night, leads north-westward of Roche Canton (*Lat. 16° 10′ N., Long. 108° 15′ E.*).

The eastern side of Baie de Tourane is partly formed by the north-western side of Presqu'île de Tien Sha; there is a projection about one mile west-south-westward of the northern extremity of Presqu'île de Tien Sha, and close off it are some rocks above water.

A small peninsula, 188 feet (57m3) high, on the northern side of which there is a ruined fort and a flagstaff, lies about 1¾ miles south-

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Chart 1342, plans of Tourane bay and Port Tourane.

westward of the projection and forms the western extremity of Presqu'île de Tien Sha. The western and southern sides of the small peninsula are bordered by rocks lying a short distance offshore, and two patches, one with a depth of 3½ fathoms (6m4) over it, and the other with a depth of 2½ fathoms (4m6) over it, lie about 1½ cables south-westward and south-south-westward, respectively, of its south-western extremity.

A light is exhibited, at an elevation of 134 feet (40m8), from a white masonry tower, about 18 feet (5m5) in height, on the western extremity of Presqu'île de Tien Sha. This light is known as Phare de l'Observatoire.

Îlot de l'Observatoire, joined to the mainland by a causeway, 10 feet (3m0) high, on a reef, lies about 3 cables south-eastward of the south-western extremity of the small peninsula mentioned above; a ridge of rocks extends nearly 2 cables north-westward from the islet. A jetty, about three-quarters of a cable long, extends from the north-eastern side of the islet.

A light is exhibited, at an elevation of 28 feet (8m5), from a small white tower, about 15 feet (4m6) in height, on Îlot de l'Observatoire.

Between Îlot de l'Observatoire and the eastern entrance point of Rivière de Tourane, about 1½ miles south-south-eastward, there is a bay. A narrow drying bank fringes the north-eastern side of this bay, and a drying bank extends about a quarter of a mile off the south-eastern side; a drying bank also extends about half a mile northward and north-westward from the eastern entrance point of the river. There are fishing stakes in the shallow parts of this bay.

Rivière de Tourane is described on page 282.

Chart 1342.

The western side of Baie de Tourane is mountainous; Nui Hoi, 3,866 feet (1,178m4) high and cone-shaped, lies about 5 miles west-south-westward of the western entrance point; Oreilles d'Ane (Asses Ears), 3,968 feet (1,209m4) high, lies about 2 miles westward of Nui Hoi, and Grand Sommet, 4,972 feet (1,515m5) high, lies about 6 miles farther westward.

Chart 1342, plans of Tourane bay and Port Tourane.

Between the western entrance point and Pointe Isabelle, 392 feet (119m5) high, about 3¼ miles south-westward, there is a bight, the shores of which are mostly steep and are bordered by rocks lying close offshore.

Between Pointe Isabelle and Pointe de Nam O, about 3 miles south-south-westward, there are two bays, divided from one another by a projection, 1,435 feet (437m4) high. A bank, with a depth of less than 3 fathoms (5m5) over it, extends about 1¾ cables from the northern shore of Baie de Nam Chon, the northern of the two bays. The western and southern shores of Baie de Lieu Chéou, the southern bay, are fringed by a drying bank which extends about one cable offshore. Song Cu Dé discharges into the south-western part of this bay. A mooring buoy is situated close off the head of Baie de Lieu Chéou.

The head of Baie de Tourane, between Pointe de Nam O (*Lat. 16° 07′ N., Long. 108° 08′ E.*) and the western entrance point of Rivière de Tourane, about 5¼ miles east-south-eastward, is low and fringed by a narrow drying sand bank. A bank, which dries one foot (0m3), extends about a quarter of a mile northward from the western entrance point of the river, and patches, which dry from one to 2 feet (0m3 to

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Chart 1342, plans of Tourane bay and Port Tourane.

0m6), lie about half a mile north-westward and 6 cables northward of the same point. Two rocky patches, the western one with a depth of 2 fathoms (3m7) over it, and the eastern one with a depth of 1¾ fathoms (3m2) over it, lie a short distance apart, about 1½ miles east-south-eastward of Pointe de Nam O and 6 cables offshore.

Anchorages.—The best anchorage is in the eastern part of Baie de Tourane. Vessels of light draught may anchor about 2 cables south-eastward of Îlot de l'Observatoire, sheltered from all winds, in a depth of 3 fathoms (5m5), mud or mud and shells.

Anchorage for vessels drawing up to 22 feet (6m7), sheltered from the force of the North-east monsoon, may be obtained about 3 cables south-westward of Îlot de l'Observatoire.

Large vessels should anchor westward or south-westward of Phare de l'Observatoire, in depths of from 6 to 8 fathoms (11m0 to 14m6), a more exposed position during the North-east monsoon period.

H.M.S. *Kent*, in 1933, anchored with the light-structure on Îlot de l'Observatoire, bearing 046°, distant half a mile.

Three mooring buoys are situated eastward of Îlot de l'Observatoire.

Storm signals.—Storm signals are shown on Îlot de l'Observatoire. *See* page 18.

Chart 1342, plan of Port Tourane.

Rivière de Tourane.—Dredged channel.—Beacons.—Lights.—Rivière de Tourane is obstructed by a shifting bar, parts of which dry, extending about 1½ miles northward from the entrance. Through the bar, a channel, in which there was a depth of 1¾ fathoms (2m3) in 1950, has been dredged, in a southerly direction, from the anchorage off Îlot de l'Observatoire to the entrance of the river. The maximum draught of vessels which could enter, in 1950, was 10 feet (3m0). This channel is protected, on its western side, by a detached breakwater nearly one mile long, its northern extremity being situated about half a mile southward of the light-tower on Îlot de l'Observatoire; another breakwater extends about 3 cables in a north-westerly direction from the eastern side of the entrance to the river. Two white concrete leading beacons, each surmounted by a triangle, are situated north-eastward of Îlot de l'Observatoire. The front beacon stands near the middle of the causeway connecting the islet with Presqu'île de Tien Sha and the rear beacon about 2¼ cables north-north-westward of the front beacon. These beacons if kept astern, bearing 352°, lead through the dredged channel to the entrance of the river.

The river is navigable for small vessels with local knowledge to the coal mines of Nangson, about 35 miles from the entrance, and it is connected by inland waterways with Rivière de Faï Fo (page 279).

In May, 1932, the French vessel *Alerte*, drawing 6 feet (1m8), entered the river and made fast to the jetty off the Residency.

A light is occasionally exhibited, at an elevation of 16 feet (4m9), from a white pylon on the outer extremity of the breakwater which extends in a north-westerly direction from the eastern side of the entrance to the river.

The western side of the channel is marked by four light-beacons, which are only lit occasionally, numbered from 1 to 4. No. 1 light-beacon (*Lat. 16° 07′ N., Long. 108° 13′ E.*) is situated close eastward of the northern extremity of the detached breakwater. Nos. 2 and 3

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Chart 1342, plan of Port Tourane.

light-beacons stand close eastward of the same breakwater, 3 and 7 cables, respectively, southward of No. 1 light-beacon. No. 4 light-beacon stands about 2½ cables southward of the southern extremity of the detached breakwater.

Leading beacons, painted white, each surmounted by a triangle, and numbered 1 and 2, are situated on the eastern side of the channel. No. 2, the front beacon, stands near the inner end of the inner breakwater, about 2¼ cables eastward of No. 4 light-beacon. No. 1, the rear beacon, stands on the drying mud bank which extends north-westward from the eastern entrance point of the river, about 3½ cables northward of No. 2 beacon. These beacons, in line astern, bearing about 004°, lead to the anchorage in the river.

Leading marks, consisting of a beacon and My Khé flagstaff, are established on the eastern bank of the river within the entrance. The front mark, No. 3 beacon, painted with red and white horizontal bands, and surmounted by a triangle, stands about 6 cables southward of No. 2 leading beacon; My Khé flagstaff, the rear mark, stands about 2 cables south-south-eastward of No. 3 beacon. These marks in line lead from the southern end of the dredged channel towards the greater depths in the river channel.

Anchorage.—Piers.—A vessel, 250 feet (76m2) long, of suitable draught, can obtain anchorage off Government house, situated on the left bank, about 4 cables south-south-westward of No. 3 beacon.

There are several piers on the western side of the river and one on the eastern side, about 1½ cables south-south-westward of My Khé flagstaff.

A pier extends from an oil depot on the western side of the river, about half a mile southward of the Custom house, which is situated about three-quarters of a mile southward of Government house. The quay on the western side of the river close inside the entrance, has a depth of 6 feet (1m8) alongside, and is connected to the general railway system. There are two cranes, each with a lifting capacity of about 5 tons.

Tidal streams.—During small tides, there is no flood stream at Tourane; even during large tides the flow in the bay does not reach half a knot, and only just reaches this rate in the river.

Tourane.—Tourane is situated on the western side of the river entrance and has a frontage of about 2 miles; it is of some importance from being the outlet from the coal mines of Nangson.

Port facilities.—Water, which is supplied to vessels at the anchorages in the bay by tank vessels, is good.

There is a military hospital. Small repairs to vessels can be effected.

Communication.—Tourane is connected to the general railway and telegraph systems. There is regular steamer communication with Saïgon, Haïphong and Hué.

There is a radio station (*Lat. 16° 05′ N., Long. 108° 13′ E.*), with two prominent masts, situated about 4½ cables north-westward of Government house. *See* page 28.

Shipping.—In 1948, 124 French vessels, of 318,400 tons, entered Port Tourane.

Climate.—The climate is healthy during the North-east monsoon period, from November to March, when fresh breezes prevail. In February squalls from northward appear, warning of which is given

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Chart 1342, plan of Port Tourane.

by the clouds collecting on the mountains northward. Exposure to the sun should be avoided during the remaining seven months of the year. In April and May, owing to the prevailing calms, the heat is stifling. At this time vessels should anchor well out in the bay away from the high land of the peninsula for the benefit of any light airs that may be experienced there, avoiding the unhealthy inshore anchorages. In June, land and sea breezes set in which somewhat temper the heat of the hottest months.

Chart 1342, plans of Tourane bay and Port Tourane.

Directions.—There are no known dangers in the approach to Baie de Tourane except Roche Canton, which vessels should avoid as directed on page 280.

To enter the river, after passing Îlot de l'Observatoire, a vessel should keep the two beacons, situated north-eastward of the islet, bearing 352°, in line astern until within about one cable northward of light-beacon No. 4 and then keep My Khé flagstaff in line with No. 3 leading beacon, bearing about 155°, until leading beacons Nos. 1 and 2 are in line, when course should be altered and these beacons kept in line astern, bearing 004°, until convenient anchorage in the river is reached.

Chart 1342.

COAST.—From Culao Han (page 280), as far as the mouth of Lagune de Phu Gia (Fu Ya), which is marked by a pagoda, about 6 miles westward, the coast is rocky; thence to a point about 6 miles north-westward, the coast is low. Cap Chon May Est (Chumai East), about 2½ miles farther north-westward, is the extremity of a steep and wooded peninsula, joined to the coast by a sandy isthmus. Nui Tron, 979 feet (298m4) high, the summit of this peninsula, is situated near its south-eastern end, about 1¾ miles from the cape.

Baie de Chon May (Tua Moi) is entered between Cap Chon May Est and Cap Chon May Ouest, 4 miles westward. A village at the head of the bay is visible from the offing. A river discharges into the south-eastern end of the bay. Between the mouth of this river and Cua Kieng, about 2½ miles westward, there is a sandy beach. The south-western side of the bay is hilly, inland; Nui Vinh Phong, 1,553 feet (473m4) high, lies about one mile south-south-westward of Cap Chon May Ouest, and Dong Nhut, 1,921 feet (585m6) high, lies about 1½ miles farther southward.

From Cap Chon May Ouest to Hon Tseu, about 140 miles north-westward, the coast is low and sandy with sandhills in places, and is backed, at a considerable distance inland, by high mountains, which are often hidden by mist, particularly during the North-east monsoon; it is locally known as the "iron coast". It affords no anchorage during the North-east monsoon, but, during the South-west monsoon, vessels may anchor anywhere off the coast in suitable depths; there are no known sunken dangers. *See* view facing page 279.

About half a mile west-north-westward of Cap Chon May Ouest (*Lat. 16° 21′ N., Long. 107° 56′ E.*) is the entrance to Passe de Tu Hien, which leads into Lagune de Cau-Hai. Two hills, on each of which is a pagoda, lie westward of the entrance to the pass, one 467 feet (142m3) high, close inland, at a distance of about 2½ miles, the other 135 feet (41m1) high and conical, on the northern side of Lagune

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Chart 1342.

de Cau-Hai, 3 miles westward. Lagune de Cau-Hai is connected by inland waterways with Rivière de Hué.

Between the entrance of Passe de Tu Hien and the mouth of Rivière de Hué, about 23 miles north-westward, the coast consists of a sandy beach backed by sandhills, on the summits of which are villages surrounded by trees and cultivated fields, a peculiarity which it is said will prevent this part of the coast being mistaken for that northward of Rivière de Hué, where the villages are on the sides of the hills and not on their summits.

Off-lying banks.—In 1941, a bank with depths of from 7 to 27 fathoms (12^{m}8 to 49^{m}4) over it, was reported to lie about 24 miles north-eastward of Cap Chon May Est.

Banc de Thuan An, with depths of from 7 to 9 fathoms (12^{m}8 to 16^{m}5) over it, lies eastward of the entrance to Rivière de Hué, almost parallel with the coast and from 5 to 7 miles offshore.

Anchorage.—Anchorage may be obtained, in a depth of 7 fathoms (12^{m}8), with good holding ground, under Cap Chon May Est, but when the North-east monsoon is fairly established it is hardly tenable.

Chart 264, plan of Hué river entrance and Chart 1342, plan of entrance to the Hué river.

Rivière de Hué.—Caution.—Considerable changes have taken place in the coast line and banks, and the plan on chart 264 no longer constitutes a safe guide to navigation; in 1940, owing to harbour works, the entrance to the river was obstructed.

The entrance of the river is about one cable wide, and is fronted by Barre de Thuan An, about one mile wide, which is subject to great and frequent changes. During the North-east monsoon, the sea breaks on the bar and it may then be considered impracticable. During the South-west monsoon, vessels with a draught of 10 feet (3^{m}0) can probably enter the river, and vessels with a draught of 5 feet (1^{m}5) can ascend to Hué (*Lat. 16° 28′ N., Long. 107° 33′ E.*). The last of the flood stream is the best time to enter; the river is much encumbered with sandbanks and fishing stakes.

The river is at its lowest level in February, and at its highest in November. The tidal streams are strong, both on the bar and in the river.

Pilots.—The services of a native pilot may possibly be obtained, but there is no regular service. Vessels should not enter without local knowledge.

Anchorage.—Anchorage may be obtained off the bar, in a depth of about 10 fathoms (18^{m}3), sand, but it is very insecure during the North-east monsoon.

Hué.—Hué is the capital of Central Viet-Nam, and the residence of the Emperor. There is a hospital.

Hué is connected to the railway and telegraph systems.

Chart 1342.

Coast.—Dangers.—Between the mouth of Rivière de Hué and Cap Lay, about 43 miles north-westward, the coast is bordered by a sandy plain with a few villages and occasional trees. The only distinguishing features are the mountains inland, the principal of which is Dong Ngai (Double Peak), 5,821 feet (1,774^{m}2) high, about 26 miles south-westward of the mouth of Rivière de Hué. Pic du Midi, 2,206 feet (672^{m}4) high, lies about 10 miles north-eastward of

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Chart 1342.

Dong Ngai. Morne Cachalot, 1,783 feet (543^{m}5) high, lies about 21 miles south-westward of Cap Lay and 17 miles inland. Dent du Tigre (Tiger tooth), 5,579 feet (1,700^{m}5) high, lies about 10 miles west-south-westward of Morne Cachalot. There is a prominent church about 16½ miles north-westward of the entrance to Rivière de Hué, and about one mile inland.

There are no known dangers off this stretch of coast except a patch, with a depth of 4¾ fathoms (8^{m}7) over it, lying about 6 miles south-south-eastward of Cap Lay (*Lat. 17° 05′ N., Long. 107° 05′ E.*), and 2½ miles offshore, and a rock, with a depth of 5 feet (1^{m}5) over it, about 2¾ miles south-south-eastward of the cape and about 3 cables offshore, so that the coast can be approached by sounding.

Chart 3542, plan of Kua Viet or Palms river.

Cua (Kua) Viet, which is often marked by breakers, is situated about 12 miles south-south-eastward of Cap Lay. There is a depth of 5 feet (1^{m}5) over the bar, which is about three-quarters of a mile outside the entrance, and is subject to change. The track recommended over the bar, and through the entrance, in 1947, is indicated by pecked lines on the chart. A post, the charted position of which is approximate, stands on the southern side of the entrance, slightly north-westward of the alignment of the recommended course across the bar.

Within the entrance the river widens and has depths of from 3½ to 5 fathoms (6^{m}4 to 9^{m}1) as far as a pagoda situated on the southern side, about 6 cables from the entrance. Above this is another bar and the river is probably only available for boats. The river leads to Kwang-Tri, the chief town of an important province; it is connected to the railway system. Hué can be reached by inland waterways.

Climatic table.—*See* page 57.

Chart 3542, plan of Kua Tung.

Cua Tung.—Cua (Kua) Tung, which is sometimes marked by breakers, is situated about 4½ miles southward of Cap Lay. It is only accessible to boats drawing 6 feet (1^{m}8). On the northern side of the entrance is a sanatorium and a village. The church, situated on the western bank of the river, about 7 cables south-westward of the entrance, is an excellent mark for approaching the entrance.

Cap Lay (*Lat. 17° 05′ N., Long. 107° 06′ E.*) is described on page 287.

Charts 2661a, 1263.

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CHAPTER VI

TONGKING GULF—CAP LAY TO HAÏPHONG

Chart 2661a.

TONGKING GULF.—General description.—Tongking gulf is comprised between the coasts of Central and Northern Viet-Nam on the west and Hainan island and the Lui-chow peninsula on the east. The entrance, between Cap Lay (*Lat. 17° 05′ N., Long. 107° 05′ E.*) and the south-western extremity of Hainan island, is about 125 miles wide. Several islands lie near the western shore and numerous islets and shoals at its head. The middle of the gulf is deep and the depths gradually decrease towards either shore; the bottom is generally soft and suitable for anchorage.

Fishing stakes are frequently met with at distances of from 25 to 30 miles offshore. They consist of several long bamboo poles, anchored by large stones, and carrying a flag; a sampan is usually attached to them, and a vessel should not pass between the sampan and the bamboos.

In the gulf and off Hainan island large patches of muddy water, resembling banks, are seen at times, but, on examination, deep water is almost invariably obtained.

Climate and weather.—*See* page 36.

Pilotage.—Pilotage is compulsory. Vessels calling at any port in the Tongking gulf, or at Haïphong, must proceed to Hon Dau (page 307), where pilots are available.

Chart 1342.

SOUTH-WESTERN SIDE OF GULF.—Coast.—Cap Lay is rocky, covered with vegetation, and from 70 to 100 feet (21^{m}3 to 30^{m}5) high. A small group of rocks extends a short distance from the cape. On the southern side of Cap Lay are some yellowish, brown cliffs, at the northern end of which is a small bay, on the shore of which is Vinh Banh village. On the northern side of the cape the cliffs are red and yellow. Some rocks lie close off these cliffs, about 1¾ miles north-westward of Cap Lay. A large, bare sandhill, 218 feet (66^{m}4) high, lies about 4 miles north-westward of the cape and about three-quarters of a mile inland; about one mile farther westward there is another hill, 149 feet (45^{m}4) high.

Between Cap Lay and Cua Dong Hoï, 37 miles north-westward, the coast is low and sandy, with villages and a few palm trees in places.

Off-lying island and bank.—Île du Tigre, 228 feet (69^{m}5) high,

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Chart 1342.

lies about 13 miles east-north-eastward of Cap Lay, separated from it by a deep and clear channel. The island is fringed with rocks on its northern and western sides, and detached rocks lie close off its eastern and southern extremities. The northern and southern ends of the island slope towards the sea. The bottom around the island is rocky and uneven.

A bank, with a depth of 9 fathoms (16m5) over it, lies about 10 miles north-westward of Cap Lay and about 3½ miles offshore.

Coast.—Aspect.—Abreast Île du Tigre during fine weather, the whole range of mountains from Dong Ngai (page 285) to the peaks in the vicinity of Cua Dong Hoï can be seen. The most prominent mountains are Dent du Tigre (page 286) and Dong Chan or Piton, 4,122 feet (1,256m4) high, about 10 miles northward. Southward of Cua Dong Hoï, the mountains, which are wooded, approach the coast. Nui Top Ray (Three Summits), 1,730 feet (527m3) high, lies about 14 miles south-south-westward of Cua Dong Hoï and 13 miles inland. Nui Da Mao or Le Nez (The Nose), 2,403 feet (732m4) high, lies 5 miles north-north-eastward of Nui Top Ray. Farther inland may be seen the jagged peaks of another range, of which Co Roong or Grand Sommet (Great Summit) is 5,050 feet (1,539m2) high and flat, situated 21 miles south-westward of Cua Dong Hoï. The mountain chain continues northward gradually receding from the coast and becoming lower. *See* view facing page 291.

Chart 1342, plan of Dong Hoï.

Cua Dong Hoï.—Light.—Buoys.—Dong Hoï, the principal town of the province of Quang Binh, stands on the western bank of Cua Dong Hoï. A church with a tower, surmounted by a dome, rising above the sandhills, stands on the western bank about three-quarters of a mile within the entrance and is prominent from the offing. On a nearer approach the belfry of a white chapel on the eastern bank, and the old fort near the western entrance, together with the red-roofed houses of the town, will be seen.

Dong Hoï (*Lat. 17° 28′ N., Long. 106° 37′ E.*) is connected to the general railway and telegraph systems.

The entrance to Cua Dong Hoï, about 1½ cables wide, is fronted by a bank, with depths of one fathom (1m8) and less, extending more than half a mile offshore; two channels, indicated by pecked lines on the chart, lead to the river entrance. The northern channel, which lies westward of the bar, had a least depth, in 1947, of 7 feet (2m1); the western channel, which lies southward of the bar, had a least depth of 6½ feet (2m0) at that date, but it passes close southward of an 8-foot (2m4) patch, situated 3¾ cables north-eastward of the light-structure. Both channels are tortuous and should not be attempted without local knowledge; they are marked by buoys, privately maintained, but they were reported, in 1947, to be missing.

A light is exhibited, at an elevation of 48 feet (14m6), from a pylon about 33 feet (10m1) in height, on the western side of Cua Dong Hoï.

Anchorages.—During the South-west monsoon, there is good anchorage off Cua Dong Hoï.

Within the entrance, there is anchorage for small vessels between the church and the chapel, in a depth of 2 fathoms (3m7).

Chart 1342.

Coast.—Dangers.—Between Cua Dong Hoï and Pointe Da Nhai,

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Chart 1342.

about 12 miles north-westward, the coast is sandy, with low cliffs in places, and is backed by sandhills.

A rock, which dries 6 feet (1m8), lies 2½ miles northward of Cua Dong Hoï light-structure and nearly one mile offshore.

A shoal, with a depth of 26 feet (7m9) over it, lies about 4 miles north-north-westward of Cua Dong Hoï light-structure, but the position is approximate.

The first of the low cliffs, mentioned above, is situated about 2½ miles north-westward of Cua Dong Hoï; about 2 miles farther north-westward there is another cliff, red in colour and rising to a wooded summit, on which stands a pagoda. The lower slopes of the mountains, and the plain behind this part of the coast, are cultivated, and the summits of the mountains are wooded.

Chart 3542, plan of Kua Li Hoa.

Cua Ly Hoa (Kua Li Hoa) is situated about 11 miles north-westward of Cua Dong Hoï. A rocky point lies about 1½ miles south-eastward of the entrance.

There is a depth of 5 feet (1m5) at high water over the bar of Cua Ly Hoa, which is only available for boats and has a channel dredged through it by fishermen after the North-east monsoon. Within the bar there are depths of 9 feet (2m7) off Ly Hoa, a village, situated on the northern side of the entrance. Above the village, the river becomes shallow and rocky in places. Ly Hoa is a fish-curing centre.

Chart 1342.

Pointe Da Nhai (*Lat. 17° 40′ N., Long. 106° 30′ E.*) consists of two rocky spurs, close together, bordered by sand; a small white pagoda stands at the foot of the northern spur. The mountains approach the coast here and form a promontory, 244 feet (74m4) high, rendering the point prominent.

Between Pointe Da Nhai and Mui Ong (Vung Chua) (page 290), about 17 miles northward, the coast is bordered with sandhills, within which is an extensive plain.

Chart 3542, plan of Kua Giang.

Cua Giang.—Light.—Anchorage.—Cua (Kua) Giang, the mouth of Song Giang, is situated about 3 miles north-north-westward of Pointe Da Nhai. A bar, about 2 cables wide and steep-to, lies about half a mile off the entrance, which is about a quarter of a mile wide. Banks, with depths of less than 6 feet (1m8) over them, extend 6 cables eastward from the northern entrance point, and 3 cables east-north-eastward from the southern entrance point; the sea breaks on these banks during strong winds.

A light is exhibited, at an elevation of 35 feet (10m7), from a white tripodial beacon, on the southern entrance point of Cua Giang.

In 1948, vessels with a draught of less than 6 feet (1m8) could cross the bar at half-tide. The channel at the entrance is marked by red buoys on the northern side and buoys painted red and black on the southern side, but they cannot be depended on. With the exception of that part of the channel between the buoys, where there was a depth of 9 feet (2m7) in 1947, there is no difficulty in entering.

There is a depth of 6 fathoms (11m0) at the anchorage in Song Giang, about half a mile within the entrance, off Quang Khe, a village, situated on the southern bank. There is a wharf at the village. Fresh provisions can be obtained at My Hoa Thuong, a village on the northern bank of the river.

Charts 2661a, 1263.

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Chart 3542, plan of Kua Giang.

Song Giang is deep as far as the mountains inland, whence timber is floated down to the mouth.

Coast.—Islands and dangers.—Between Cua Giang and Cua (Kua) Ron, about 10 miles northward, the coast is low and sandy. Montagne de Marbre (Mount Marble), which is isolated, lies in the plain, about 10 miles west-north-westward of Cua Giang. A rocky bank extends about 2¼ miles eastward from Cua Ron, near the outer extremity of which is Hon No, a coral reef, which dries 3 feet (0m9), and is connected to the reefs extending southward from Vung Chua (*see* below), all of which should be given a wide berth.

Chart 3542, plan of Kua Rôn.

Cua (Kua) Ron can be identified by a pagoda and some houses. Both entrance points are foul; the channel is only available for junks at high water, and is subject to change. The tidal streams run strongly, but the sea is broken by the reef extending from the northern entrance point. Cua Ron is probably only practicable in the fine season.

The village of Ron, the centre of important salt works, stands on the northern bank, about half a mile within the entrance; the village of Canh Duong Xa stands on the southern entrance point.

Chart 1342.

The coast for about 2 miles north-north-eastward of Cua Ron is low and sandy, and fringed by a bank, with depths of from 2 to 18 feet (0m6 to 5m5) over it, extending nearly 1¼ miles offshore. Hon Trot (Tu-ut), with a depth of 6 feet (1m8) over it, lies on the outer edge of this bank about 1¼ miles northward of Hon No. Between the northern end of this sandy coast and Mui Ong or Cap Boung Quioua (Cape Vung Chua), about 3¼ miles north-eastward, there are two bights, the northern of which is Vung Chua, divided about midway, by Mui Rong, a rocky projection. The shores of these bights consist of sand, backed by the foot of the mountains which rise steeply inland. On the shore of the northern bight there is a village, surrounded by verdure.

An island, the northern part of which is named Hon Vung Chua (*Lat. 17° 55′ N., Long. 106° 29′ E.*), and the southern part, Hon Nam, 201 feet (61m3) high near the middle, lies off the southern bight, about 3 miles north-eastward of Cua Ron. A reef, at the outer end of which is a rock, with a depth of less than 6 feet (1m8) over it, extends half a mile westward from Hon Nam, and there is foul ground thence to the mainland westward. There is also foul ground between the northern end of Hon Vung Chua and the mainland, about 4 cables northward.

Hon La, 388 feet (118m3) high, lies about 6 cables east-south-eastward of Mui Ong, and Hon Co (Kau), 188 feet (57m3) high, lies about 1½ cables eastward of the same point. There is a deep and narrow channel between these two islands, and between Mui Ong and Hon Co there is a depth of 1¾ fathoms (3m2). The south-western side of Hon Co is fringed by rocks, and a shoal, with a depth of 2 feet (0m6) over it, lies about 4 cables southward of Mui Ong.

Hon La and Hon Co, with the northern of the two bights, previously mentioned, form Vung Chua.

Mui Ong can easily be identified by the large red patches on it and a pagoda; it rises to an elevation of 506 feet (154m2) about one mile within, and there are two prominent wooded summits, one named Ba Coc, 2,698 feet (822m4) high, situated about 7 miles west-north-west-

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To face page 290.

Dong Hoï fort,
bearing 240°, distant 10 miles.

Coast in the vicinity of Dong Hoï from north-eastward.

(*Original dated* 1933.)

Hon Tseu,
bearing 250°,
distant about 4 miles.

Coast from Mui Ong to Les Mamelles from east-north-eastward.

(*Original dated* 1933.)

Les Mamelles,
bearing 150°.

Hon Nhuong.

Ru Cua,
bearing 167°.

Mont Besson,
bearing 185°.

Portion of coast from a position about 10 miles eastward of Nui Nam Giai.

(*Original dated* 1929.)

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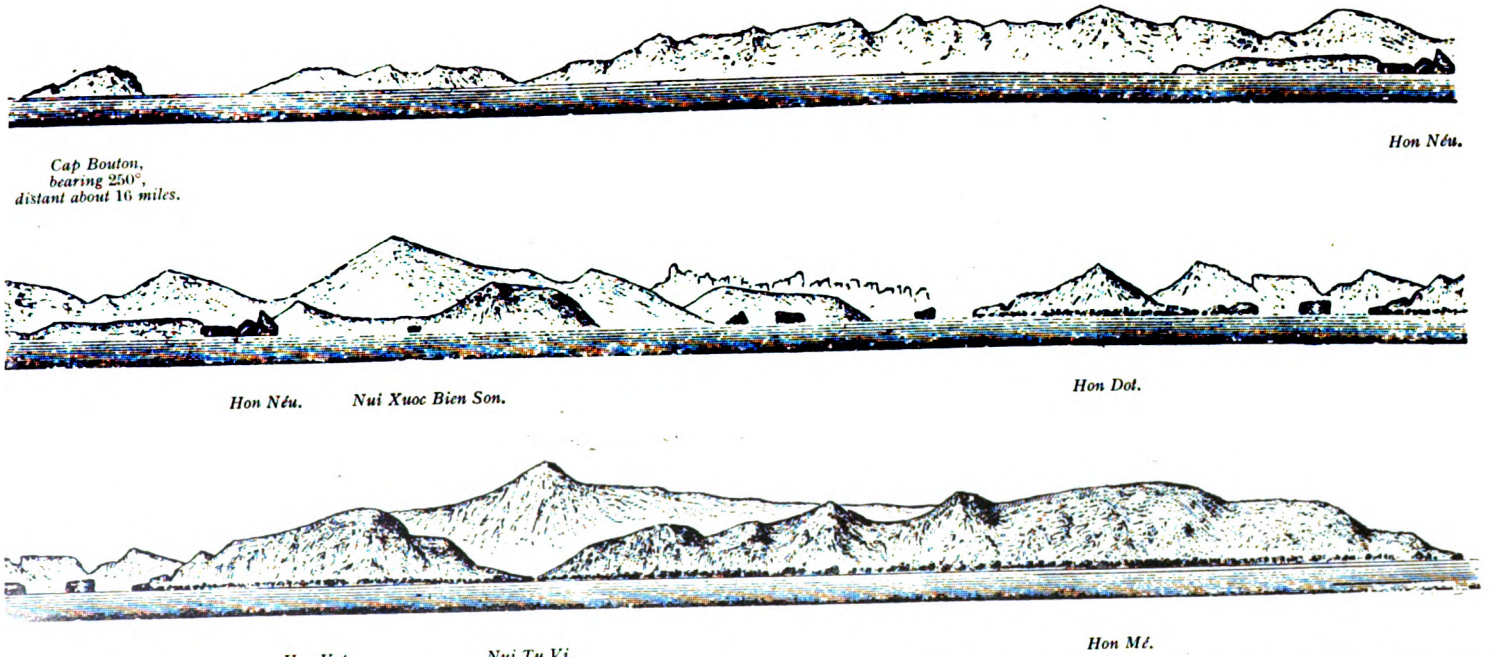
To face page 291.



View, in three parts, of coast, from a position about 7 miles east-south-eastward of Hon Mé.

(*Original dated* 1930.)

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Chart 1342.

ward of the point, and Hoanh Son, the other, 3,423 feet (1,043m3) high, about 3¼ miles farther westward. *See* view facing this page.

Off-lying islet.—Bank.—A bank, with a depth of 10 fathoms (18m3) over it, the existence of which is doubtful, was reported by the *Rolla* to lie about 33 miles eastward of Mui Ong. It was unsuccessfully searched for by the French vessel-of-war *Lutin*, in 1888, and is not shown on the French charts.

Hon Gio (Dio) or South Watcher, 270 feet (82m3) high, rugged and steep-to, lies about 9 miles eastward of Mui Ong.

Anchorages.—Vung Chua is the only place along this part of the coast where protection can be obtained during the North-east monsoon; the bay affords good holding ground, but is exposed to the swell. The best entrance is southward and westward of Hon La.

A small vessel can anchor under the shelter of the islets, with the summit of Hon Tseu (*see* below), bearing 342°, and seen between Mui Ong and Hon Co, in depths of from 3 to 5 fathoms (5m5 to 9m1), mud.

Larger vessels should keep Hon Gio open southward of the southern extremity of Hon La. *Le Bourayne* anchored with the western extremity of Hon Co bearing 350°, in a depth of 10 fathoms (18m3), mud.

During the South-west monsoon, vessels can find good anchorage northward of Mui Ong, or off Mui Doc, situated about one mile north-north-westward of the cape.

Coast.—Between Mui Ong (*Lat. 17° 57′ N., Long. 106° 31′ E.*) and Mui Doc the coast is rocky. Mui Doc rises to an elevation of 772 feet (235m3) about three-quarters of a mile westward of its extremity. Mui Dao, a low point, lies about 2½ miles north-north-westward of Mui Doc, and another low point lies about half a mile farther north-north-westward; thence there is a sandy coast, on which are some isolated clumps of trees, for about 7 miles north-north-westward to the base of Dinh Chua, a rocky promontory, 752 feet (229m2) high, of which Mui Ron (Duong) is its north-eastern extremity. Ru Can Son (Vung Han hill), 1,202 feet (366m4) high, and prominent, lies 3¾ miles south-westward of Mui Ron.

Hon Tseu or Hon Son Duong, 450 feet (137m2) high, and wooded, lies about 1½ miles south-eastward of Mui Ron. From eastward it has the appearance of three pointed hummocks, with a perpendicular cliff towards its northern end, and sloping towards the south-western end. (*See* view facing page 290.) A reef, which dries about 12 feet (3m7) at its outer end, extends about 4 cables from the south-eastern extremity of Hon Tseu, and Recif de l'Hamelin, with a depth of 7 feet (2m1) over it, and steep-to on its northern and southern sides, extends about 2¾ cables west-south-westward from its western extremity.

Hon Con Chim (Hon Chim), 86 feet (26m2) high, and rocky, with two pointed peaks, lies about 1½ miles east-north-eastward of Hon Tseu.

Anchorage.—There is good anchorage about half a mile southward of Hon Tseu, which is steep-to, with its western extremity bearing 325° and Hon Con Chim, 055°, in a depth of 6 fathoms (11m0), mud. The islet, and the reefs which extend from its extremities, shelter this anchorage, but during the North-east monsoon the swell is considerable.

Charts 1342, 2062.

Coast.—Aspect.—Between Mui Ron and Cap St. Anne, about 60 miles north-westward, the coast consists in general of sandy beaches, within which are sandy plains backed, in the interior, by ranges of

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Charts 1342, 2062.

high mountains. These mountains, which approach the coast at Mui Ong, curve westward and then north-westward, following to some extent the curve of the coast. The most prominent peak is Mont Borie, 7,772 feet (2,368^{m}9) high, which lies about 58 miles westward of Mui Ron and 35 miles inland. From northward, this peak presents a remarkable double summit, but it is often hidden by clouds. There are prominent isolated peaks on the plains near the coast.

Vung Han, a bay, is entered between the western extremity of Mui Ron and a point about 2 miles west-south-westward. The bay affords shelter from easterly and southerly winds, but is open from winds from a north-easterly to westerly direction, and is therefore only available during the South-west monsoon. Small craft with local knowledge can, however, find shelter during the North-east monsoon under a rocky projection on the eastern side of the bay, about 3 cables within the entrance. The large village of Vinh Trung (Kom Lanh) and the village of Van Ang stand at the head of the bay, which is low and sandy and can be approached by vessels according to their draught.

Cua Khau (Kua Kau), the narrow outlet of a large lagoon, is situated about 2¾ miles west-south-westward of the western extremity of Mui Ron; separated from Vung Han by Ru Cao Vuong, 1,144 feet (348^{m}7) high, Cua Khau is obstructed by a bar which dries. The village of Ki-Auh (Ki Hoa) stands at the head of the lagoon; the latter is connected to Cua Nhuong (*see* below) by a canal, which is only available for sampans.

Between Cua Khau and a point about 9 miles north-westward, the coast consists of sandy beaches. A rock, with a depth of less than 6 feet (1^{m}8) over it, lies close off this; point thence to the entrance of Cua Nhuong, about 8 miles west-north-westward, the coast is fringed by a rocky bank, with depths of less than 3 fathoms (5^{m}5) over it, extending half a mile offshore in places. A shoal, with a depth of 11 feet (3^{m}4) over it, lies outside this bank, about 3¾ miles eastward of the eastern entrance point of Cua Nhuong (*Lat. 18° 16′ N., Long. 106° 07′ E.*). This stretch of coast consists of sandy beaches separated from one another by the cliffs of the coastal hills. The latter increase in elevation towards Cua Nhuong, eastward of which, for a distance of 1¾ miles, the cliffs are high and precipitous.

Les Mamelles (The Paps), two prominent peaks, 1,443 feet (439^{m}8) high, with Nui Rut, 266 feet (81^{m}1) high, about 1½ miles south-eastward of them, lie about 5 miles north-westward of Cua Khau and three-quarters of a mile inland. *See* views facing page 290.

A cultivated plain, on which are many hamlets, extends from Les Mamelles to the foot of the mountains in the interior. Ru Cua (Nuong), 1,502 feet (457^{m}8) high, conical and prominent, lies 1¾ miles east-south-eastward of the eastern entrance point of Cua Nhuong and three-quarters of a mile inland. A peak, 953 feet (290^{m}5) high, lies about 2½ miles south-south-westward of Ru Cua.

Hon Nhuong (Nuong), 134 feet (40^{m}8) high, precipitous, and distinguishable by its rectangular shape, lies about 3½ miles north-eastward of the eastern entrance point of Cua Nhuong. A ridge of rocks, 22 feet (6^{m}7) high, extends about 3 cables east-south-eastward from the islet; a short distance south-eastward of these rocks the sea has been observed to break.

Breakers were reported, in 1860, about 2 miles south-eastward of

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Charts 1342, 2062.

Hon Nhuong and 1½ miles from the mainland, but the position is doubtful.

Cua Nhuong.—Dangers.—About one mile northward of the entrance to Cua Nhuong is Hon Buc, a group of grey rocks, from 12 to 16 feet (3m7 to 4m9) high, and numerous sunken rocks, and some which dry. A shoal, with a depth of 7 feet (2m1) over it, and a rock which dries 4 feet (1m2), lie, respectively, about 2¾ cables south-westward and 2¼ cables south-south-westward of the largest of the easternmost rocks of the group. A shoal, with a depth of less than one foot (0m3) over it, lies about three-quarters of a mile north-eastward of the eastern entrance point of Cua Nhuong and 4 cables offshore, and between this shoal and Hon Buc are two patches, with depths of 11 and 13 feet (3m4 and 4m0) over them, respectively.

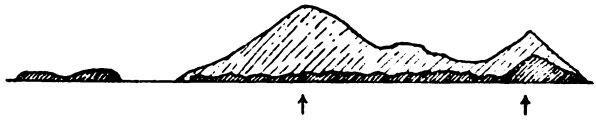
The entrance of Cua Nhuong is very narrow and is obstructed by a bar, over which there is a depth of only one foot (0m3). Some rocks lie close north-eastward of the eastern entrance point. The western entrance point, on which there is a village, is low and sandy, and the coast for about one mile westward of it is fringed by a bank, which dries 3 feet (0m9), extending from half a cable to 1½ cables offshore.

Anchorage.—During the South-west monsoon, vessels with local knowledge can anchor northward of Hon Buc, in depths of from 5 to 6 fathoms (9m1 to 11m0).

Coast.—Mont Besson, 350 feet (106m7) high, with a pagoda on its eastern slope, lies close to the coast about 2 miles west-north-westward of Cua Nhuong. Another hill, 150 feet (45m7) high, lies about 1½ miles westward of Mont Besson and nearly one mile inland. (*See* view facing page 290.)

Chart 2062.

Between Mont Besson and Nui Nam Giai (Ru Shott), 13 miles north-westward, the coast is low, sandy and bare of vegetation. Nui Nam Giai, 1,220 feet (371m9) high, lying about three-quarters of a mile inland, is the summit of a ridge terminating about 1¾ miles northward in Mui Sot, which is 186 feet (56m7) high, cliffy and connected to the coast by a narrow, low, sandy isthmus. A rock, 8 feet (2m4) high, lies about three-quarters of a cable northward of Mui Lo, situated about 2 cables northward of the summit of Mui Sot (*Lat. 18° 28′ N., Long. 105° 56′ E.*).



(*Original dated* 1929.)

Cua Sot (Kua Shott) is entered on the western side of Mui Lo; the western entrance point, which is low and sandy, lies about 1½ miles south-westward of Mui Lo. The entrance is obstructed by a bar about 4 cables wide, with a least depth of 6 feet (1m8) over it, situated about 3 cables south-westward of Mui Lo. A rock, awash, lies about 6 cables south-westward of Mui Lo and about 2 cables from the eastern shore. Within the bar the depths are greater, but the channel is reduced to

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Chart 2062.

a width of a little over one cable by a bank, which dries 4 feet (1m2), extending about 3½ cables east-north-eastward from the western entrance point. The village of Kim Doï stands close within the western entrance point. Small craft with local knowledge can find restricted anchorage within the bar.

Between Cua Sot and Cua Hoi, 20 miles north-north-westward, the coast is sandy. Bong Son (Kindoy hill), 695 feet (211m8) high, lies about 3 miles westward of Mui Lo and nearly one mile inland. Nui Ong, consisting of four peaks, the highest of which has an elevation of 2,326 feet (709m0), is the highest range in this vicinity and lies about 6½ miles north-westward of Bong Son and 2½ miles inland.

Cua Hoi, the mouth of Song Ca (Hoi), is described on page 295. Between it and the mouth of Song Cua (Kua) Lo, 5 miles north-westward, the coast is low and sandy, and fringed by a bank, which dries, extending about 1½ cables offshore. Roche Cua Lo, which is high, black and prominent, with a reef extending one cable north-eastward from it, lies on the edge of this coastal bank, about one cable off a small projection in the coast, nearly one mile south-eastward of the southern entrance point of Song Cua Lo. A rocky patch, with a depth of 2¼ fathoms (4m1) over it, lies about three-quarters of a mile eastward of Roche Cua Lo. A bank, which dries, extends about 4 cables northward and north-eastward from the latter point, leaving a narrow channel, only accessible to boats, between it and the northern bank of the river. Mui Rong, the northern entrance point of Song Cua Lo, lies about half a mile east-north-eastward of the southern entrance point. Mui Rong is cliffy and a hill, 334 feet (101m8) high, lies about a quarter of a mile westward of it.

Rocks, some of which dry 9 feet (2m7), extend about 3 cables eastward from Mui Rong, and a group of rocks, some of which dry about 8 feet (2m4), lies from 2 to 4 cables farther eastward.

Between Mui Rong and Cap St. Anne, about three-quarters of a mile northward, there is a shallow bight, with a sandy beach at its head.

Cap St. Anne (*Lat. 18° 51′ N., Long. 105° 43′ E.*) consists of cliffs and is fringed by a reef. A shoal, with a depth of less than 6 feet (1m8) over it, lies about 3 cables north-eastward of the cape.

The sandy plain, through which Song Ca (page 295) flows, is terminated by a range of mountains, the summit of which is Ru Than Vu, 1,443 feet (439m8) high, situated 7 miles west-north-westward of Cap St. Anne; Nui Daï Vac (Nui Yen), 1,410 feet (429m8) high, lies about 1½ miles farther westward.

Off-lying islets and dangers.—Several islets and dangers lie off the coast described above, some of which are in the approach to Cua Hoi.

Hon Matt, 712 feet (217m0) high, lies about 13½ miles east-south-eastward of Cap St. Anne. The islet is precipitous except on its southern side. A rock, awash, lies close off its south-eastern extremity and Roche des Pêcheurs, with a depth of 5 feet (1m5) over it, lies about 1½ miles north-westward of its north-western extremity.

Hon Truan, 141 feet (43m0) high, the easternmost of the islets lying off this part of the coast, is situated about 1¼ miles eastward of the southern extremity of Hon Matt. A rock, above water, with a rock which dries 3 feet (0m9), close eastward, lies about 1½ cables north-westward of Hon Truan.

Charts 2661a, 1263.

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Chart 2062.

Roche Nom or Grand Rocher, 40 feet (12m2) high and fringed by rocks on its south-western and south-eastern sides, lies in the eastern approach to Cua Hoi, about 7 miles west-south-westward of Hon Matt and 3½ miles offshore. A rocky patch, with a depth of 2 fathoms (3m7) over it, lies nearly half a mile north-westward of Roche Nom. Roche Lap or Petit Rocher, 3 feet (0m9) high and flat, lies about one mile north-westward of Roche Nom. A rocky patch, with a depth of 4¼ fathoms (7m8) over it, lies about 2 cables southward, and a rocky patch, with a depth of 2 fathoms (3m7) over it, lies about the same distance westward of Roche Lap.

Hon Nieu lies in the northern approach to Cua Hoi, about 4 miles south-eastward of Cap St. Anne and about 1¾ miles offshore; it consists of two hills, the higher and eastern of which is 433 feet (132m0) high, and is separated from the other by a low neck; from a distance, on a southerly bearing, it has the appearance of two islets.

Plateau du Large, a group of rocks, one of which is about one foot (0m3) high, is the northernmost of the dangers lying off this part of the coast, and is situated about 2¼ miles northward of Hon Nieu and about 3 miles offshore. Plateau du Large is generally visible or can be distinguished by the sea breaking over it. A rocky patch, with a depth of 3½ fathoms (6m4) over it, lies about 4 cables westward of the one-foot (0m3) rock. Roche St. Anne, which dries one foot (0m3), lies about 1¼ miles west-south-westward of Plateau du Large and midway between the latter and the outer group of rocks lying off Mui Rong. A rock, with a depth of less than 6 feet (1m8) over it, the existence of which is doubtful, is charted about 1¼ miles north-north-eastward of Hon Nieu.

Anchorages.—During the North-east monsoon, a small vessel could find shelter under the south-western side of Hon Matt, in a depth of 11 fathoms (20m1).

There is good anchorage, sheltered from north-easterly winds, for small vessels with local knowledge under the south-western side of Hon Nieu (*Lat. 18° 48′ N., Long. 105° 46′ E.*), in a depth of about 4¼ fathoms (7m8). This anchorage is frequented by vessels unable to enter Cua Hoi.

Cua Hoi.—Song Ca.—Lights.—Buoys.—The entrance to Cua Hoi is about 2 cables wide; both entrance points are low and sandy.

A light is exhibited from the southern side of the entrance, and a light is exhibited, at an elevation of 35 feet (10m7), from a black pyramidal tower, with a white cylindrical top, about 26 feet (7m9) in height, on the northern entrance point.

A bank, with depths of less than one fathom (1m8) over it, extends about 1¾ miles east-north-eastward from the northern entrance point and about 1¼ miles north-eastward from the southern entrance point.

The bar, composed of hard sand and subject to frequent change, is situated from three-quarters of a mile to 1¾ miles east-north-eastward of the entrance. In 1941, there was a least depth of 4 feet (1m2) on the bar. No vessel should attempt to cross the bar without recent local knowledge.

Within the entrance, leading lights indicate the channel of the river.

The channel across the bar was, in 1949, marked on the southern side by a black conical buoy surmounted by a cylinder. The inner channel is also marked by buoys.

Charts 2661a, 1263.

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Cua Hoi leads into the Song Ca; vessels able to cross the bar of Cua Hoi can ascend the river to Ben Thuy (Bin Tui), about 10 miles from the entrance, but the channel is subject to frequent changes. The only known dangers are a rock, which dries about one foot (0m3), situated near the eastern bank of the river about 4 miles southward of the northern entrance point, and a shoal, which very nearly dries, lying close off Yen Luu, a village situated in a bend, on the northern bank of the river, about 2 miles north-eastward of Ben Thuy.

Vinh, the capital of the province of Ngé An, is situated about 2 miles north-westward of Ben Thuy.

Tidal streams.—Tidal signals.—With large tides, the in-going stream lasts for 6 hours, and the out-going for 18 hours. With small tides there is no in-going stream. During spates the current is very strong.

At Ben Thuy slack water is about 1¾ hours after that at Cua Hoi, or about one hour after high and low water.

A black framework mast, with a yard and surmounted by an arrow, is situated close westward of the light-structure on the northern entrance point. There is a similar mast at Ben Thuy.

Signals are displayed from these masts indicating the height of the tide above chart datum by means of cones, cylinders and balls by day, and by *white*, *red* and *green* lights at night. When the tide is rising, a white cone, point up, is displayed; a white cone, point down, indicates that the tide is falling.

Pilot.—Vessels requiring a pilot should give 24 hours' notice. The pilot will then meet the vessel outside the bar or off Îlot Nieu.

Anchorage.—There is good anchorage off Ben Thuy, in a depth of 4¼ fathoms (7m8). A vessel drawing 10 feet (3m0) can anchor about half a cable from the outer end of the piers.

There are some mooring buoys off Ben Thuy.

Ben Thuy.—Port facilities.—There are several piers at Ben Thuy, with depths of from 7 to 10 feet (2m1 to 3m0) at their heads, at which vessels can lie on the mud at low water.

Small repairs can be executed.

Some fresh provisions can be obtained.

There is a hospital in the town.

Communication.—Ben Thuy is connected to the general railway and telegraph systems.

There is frequent steamer communication with Saïgon, Haïphong, and other ports in Viet-Nam.

Storm signals.—Storm signals are shown at Ben Thuy, *see* page 18.

WESTERN SIDE OF GULF.—Coast.—Dangers.—Baie du Brandon is entered between Cap St. Anne (*Lat. 18° 51′ N., Long. 105° 43′ E.*) (page 294), and Cap Falaise, about 15 miles northward. The latter rises steeply to an elevation of 620 feet (189m0) about half a mile inland, and on its northern face there is a broad light-coloured stripe.

Baie du Brandon affords but little shelter, as it is open north-eastward and, during the South-west monsoon, the winds are south-easterly.

The mountains lie at a considerable distance from the head of the bay, and there are no landmarks near the coast other than Le Paté,

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Chart 2062.

an isolated peak of regular form, 482 feet (146^{m}9) high, which lies about 12½ miles north-westward of Cap St. Anne and 5 miles inland.

For a distance of about 5½ miles north-westward of Cap St. Anne, the south-western shore of Baie du Brandon is indented by a number of small bays backed by hills; the projections which form these bays are steep and cliffy with rocks lying close offshore. The western shore of the bay is low and fringed by a drying bank, which extends about a quarter of a mile offshore.

Cua (Kua) Vann is situated at the head of the bay, about 10½ miles north-north-westward of Cap St. Anne. The entrance is about a quarter of a mile wide and obstructed by a bank, which dries as much as 6 feet (1^{m}8) in places, and extends eastward for three-quarters of a mile. Large junks enter Cua Vann, and during the fine season a considerable number of fishing boats make use of it and may be met with at distances of from 10 to 15 miles offshore.

A group of rocks, one of which is 39 feet (11^{m}9) high, lies on the coastal bank about 3 miles northward of Cua Vann and close offshore.

Cua Thoi is situated in the northern part of Baie du Brandon, about 3½ miles west-south-westward of Cap Falaise; the coastal bank, which dries from 4 to 9 feet (1^{m}2 to 2^{m}7), extends three-quarters of a mile offshore at Cua Thoi. A rock, which dries 4 feet (1^{m}2), lies in the approach to Cua Thoi, about 3¾ miles south-westward of Cap Falaise and about 8 cables offshore.

Between Cap Falaise and a point about 3 miles south-westward, the north-western side of Baie du Brandon is cliffy and fringed with drying rocks extending a short distance offshore in places. The outermost of these rocks, which dries 7 feet (2^{m}1), lies 2½ miles south-westward of the cape and about 1½ cables offshore. Lach Quen (Lakh Kuen) is situated about 1½ miles west-south-westward of Cap Falaise.

Chart 264, plan of Lakh Kuen.

Lach Quen.—Anchorage.—The entrance to Lach Quen is about 3 cables wide. Kon Niu, 341 feet (103^{m}9) high, lies 2 cables north-north-eastward of the eastern entrance point.

Rocher du Buffle (*Lat. 19° 06′ N., Long. 105° 43′ E.*), above water, with other rocks, from one to 4 feet (1^{m}2) high, close to it, lies close southward of the eastern entrance point. Rocher du Chien (Dog rock), 62 feet (18^{m}9) high, lies 2¼ cables westward of Rocher du Buffle. Nui Ky, 383 feet (116^{m}7) high, lies 2 cables westward of the western entrance point. Banks, which dry, extend from both sides of the entrance, and restrict the width of the channel to about 45 yards (41^{m}1).

There are depths of from one to 3 feet (0^{m}3 to 0^{m}9) in the fairway of the channel, a short distance within the entrance; between Phu (Fu) Duc, a village on the western side about half a mile within the entrance, and Manh Son (Man Shon), a village on the eastern side abreast Phu Duc, the depths in the channel increase.

The anchorage, abreast Manh Son, is perfectly sheltered and has depths in it of from 3 to 4 feet (0^{m}9 to 1^{m}2). Being somewhat protected by the coast, it is often possible for small vessels with local knowledge to enter Lach Quen during the North-east monsoon, when the bars of other rivers are not practicable.

Charts 2661a, 1263.

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Coast.—Dangers.—Between Cap Falaise and Cua Trap (Kua Trapp), about 7 miles northward, the coast is low and sandy, except for a group of rocks, some of which are sunken, which lies from 2½ to 3½ miles northward of the cape, and close inshore; two of these rocks are prominent, and Hon Tru, the highest, has an elevation of about 260 feet (79m2).

Cap Bouton (Buton), 453 feet (138m1) high, and wooded, is the eastern entrance point of Cua Trap. Two rocks, the southern of which dries 5 feet (1m5), lie close together about one mile east-north-eastward of Cap Bouton and about 3 cables offshore. A reef, on the western side of which is a bank, which dries, about one cable wide, extends about one cable from the southern extremity of the cape. *See* view facing page 291.

Cua Trap, a shallow estuary, is entered between Cap Bouton and a point about three-quarters of a mile westward. A sandbank, which dries 5 feet (1m5) in places, extends from the western side of the estuary, leaving a narrow channel on the eastern side which is used by fishing boats.

Off-lying dangers.—Two shoals, the existence of which is doubtful, with depths of 3¼ and 3¾ fathoms (5m9 and 6m9) over them, are charted about 7 miles south-eastward and 4 miles south-south-eastward, respectively, of Cap Bouton.

For about 7 miles northward of Cap Bouton, the coast is bordered by a range of hills, thence to Cap Bang, about 5½ miles farther northward, the coast is sandy.

Cap Ta Lus, joined to the mainland by a narrow neck of sand, lies about 4 miles north-north-eastward of Cap Bouton. About 6 cables northward of Cap Ta Lus is the southern extremity of Hu Truong, a steep cliff the summit of which, nearly one mile farther northward, is 560 feet (170m7) high. A river discharges close northward of this cliff.

Nui Xuoc, 1,410 feet (429m8) high, lies about 6 miles northward of Cap Bouton and 3¼ miles inland.

Bien Son.—Light.—Dangers.—Bien Son (Shon), an island, 531 feet (161m8) high at its northern end, lies 2 miles north-north-eastward of Cap Ta Lus and about 3 cables offshore, being joined to the mainland by a bank, which dries from 3 to 6 feet (0m9 to 1m8). *See* view facing page 307.

A light is exhibited, at an elevation of 82 feet (25m0), from a grey tower with a yellow dwelling, about 16 feet (4m9) in height, near the northern extremity of Bien Son (*Lat. 19° 20′ N., Long. 105° 49′ E.*).

There is a remarkable vertical rock, almost detached, at the south-eastern extremity of Bien Son; foul ground, the outer end of which dries 5 feet (1m5), extends about 3½ cables southward from the island.

Le Doigt, a rocky point, lies about 3 cables north-north-westward of the south-western extremity and a steep-to point lies about one mile farther north-north-westward. The north-western extremity of the island is fringed by a bank, on which there is a rock, above water, and several patches which dry. At the northern end of the island there is a shallow bay entered between the north-western extremity and the western side of the northern extremity, 3½ cables north-eastward. There is a ruined fort on the western side of the northern extremity of the island, and the light-tower is situated about a quarter of a mile south-eastward of the fort.

Charts 2661a, 1263.

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Anchorage.—There is anchorage for small craft with local knowledge in the bay at the northern end of Bien Son. It is frequented by junks in the fine season, and affords good shelter during the South-west monsoon. A small vessel may obtain good anchorage, with northerly or north-easterly winds, nearly midway between the entrance points, with the ruined fort bearing 075°, in depths of from $2\frac{3}{4}$ to $3\frac{1}{4}$ fathoms (5^m0 to 5^m9).

Off-lying islets and dangers.—A shoal, with a depth of $5\frac{1}{4}$ fathoms (9^m6) over it, lies about 4 miles eastward of the southern extremity of Bien Son.

A group of islets, all of which are precipitous, lies off the part of the coast described above. The islets are uninhabited and only frequented by fishermen in summer.

Hon Mé, the north-easternmost and most important of the group, lies about $5\frac{1}{4}$ miles east-north-eastward of Bien Son light-tower. Hon Mé has several wooded peaks, the highest of which has an elevation of 800 feet (243^m8); the islet is very steep on its northern and eastern sides. A detached rock lies close off its north-eastern extremity, and another detached rock, the position of which is doubtful, lies close off the western side of the islet.

Hon Vat, 432 feet (131^m7) high, lies about 2 cables south-south-eastward of Hon Mé, with Ko King, an islet, 58 feet (17^m7) high, about midway between. There is foul ground between Ko King and Hon Mé, and a rock, which dries 2 feet (0^m6), lies close off the north-eastern side of Ko King.

Hon Vang, 189 feet (57^m6) high, lies $2\frac{1}{4}$ cables westward of the western extremity of Hon Mé. Two islets lie about three-quarters of a cable south-eastward of the southern extremity of Hon Vang, and a rock, which dries about 8 feet (1^m2), lies about 2 cables south-south-eastward of the island. An islet lies close north-north-westward of Hon Vang.

Hon Dot, 376 feet (114^m6) high and conical, lies about $1\frac{1}{2}$ miles south-westward of Hon Mé. Hon Tio lies about $1\frac{3}{4}$ cables south-eastward of Hon Dot. Hon Men is the largest of a group of rocks which lies about 6 cables south-westward of Hon Dot; the largest and northernmost rock is 114 feet (34^m7) high and is pierced. Hon Sap and Hon Néu are groups of rocks, the highest of which have elevations of 48 and 160 feet (14^m6 and 48^m8), lying about three-quarters of a mile and $1\frac{1}{2}$ miles, respectively, south-eastward of Hon Men (*Lat. 19° 20′ N., Long. 105° 53′ E.*).

Hon Bong, 209 feet (63^m7) high, is the north-westernmost islet of a group lying $2\frac{1}{4}$ miles west-south-westward of Hon Mé. A ledge of sunken rocks, on the western edge of which are some which dry about 2 feet (0^m6), extends about 4 cables west-south-westward from Hon Bong. Hon Hop consists of two rocks, the eastern of which is 68 feet (20^m7) high, lying $1\frac{1}{2}$ cables eastward of the southern extremity of Hon Bong. Hon Gok, 163 feet (49^m7) high, is the largest of three islets close together, lying about $2\frac{1}{2}$ cables south-eastward of Hon Bong.

A bank, with depths of less than 5 fathoms (9^m1) over it, extends about $1\frac{1}{4}$ miles southward from Hon Bong.

Basse de Van Yen, a rock, with a depth of 2 fathoms (3^m7) over it, lies about 2 miles northward of Bien Son (page 298).

Anchorages.—There is good anchorage for vessels with local

Charts 2661a, 1263.

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Chart 2062.

knowledge off the south-western side of Hon Mé, between Hon Vang and Hon Vat, in depths of from 4 to 4½ fathoms (7m3 to 8m2).

Vessels with local knowledge can also anchor, sheltered from north-easterly winds, between Hon Vang and the south-western side of Hon Mé, in depths of from 7 to 11 fathoms (12m8 to 20m1).

Coast.—Cua (Kua) Bang, entered 7½ miles northward of Cap Ta Lus (page 298), has a very narrow entrance, and is only accessible to boats. Cap Rond, 301 feet (91m7) high, the southern extremity of a peninsula, is the eastern entrance point. Within Cua Bang are several villages, the most important of which is Ba Lang, which stands on the western side of the above-mentioned peninsula, about one mile northward of the summit of Cap Rond. There is a church in the village, the tower of which can be seen above the trees from seaward.

Between Cap Rond and Cap Bang, about 2 miles north-eastward, there is a shallow bay, the shores of which are bordered by sandhills.

Cap Bang, the summit of which is in the form of a finger dominating the sandhills, is 298 feet (90m8) high. Between Cap Bang and Cap Chao (Shao), 18 miles northward, there is a sandy plain. About 3¼ miles northward of Cap Bang, a rock, 3 feet (0m9) high, lies about 2 cables offshore; another rock, which dries 7 feet (2m1), lies about a quarter of a mile south-south-eastward of this rock.

Aspect.—A range of mountains lies within this part of the coast. The summit, Nui Tu Vi, 1,833 feet (558m7) high and cone-shaped, lies at the southern end of the range about 6 miles westward of Cap Bang. Nui Cac (Diaz), 1,659 feet (505m7) high, lies at the northern end, 4 miles from Nui Tu Vi. Some other hills lie nearer the coast, of which Nui Bom (Kong), 1,069 feet (325m8) high, lies about 4 miles north-eastward of Nui Cac and 2 miles inland.

Northward of Nui Cac is the plain of Thanh Hoa, through which flow the rivers Song Yen and Song Ma. The plain is also watered by numerous canals and is wooded; it is cultivated near the coast and studded with villages. La Dent, 990 feet (301m8) high, lies on this plain about 10 miles north-westward of Nui Cac. *See* view facing page 307.

Coast.—Lach Yapp, the mouth of Song Yen, lies about 9 miles northward of Cap Bang; its entrance is narrow, and banks, on which the sea breaks, and which dry from one to 6 feet (0m3 to 1m8), extend nearly three-quarters of a mile from the entrance points, leaving a channel, about one cable wide, between them. The bar, at the outer end of this channel, has a depth of 4 feet (1m2) over it; within the entrance a bank of mud nearly obstructs the river, leaving only a narrow channel near the western bank, in which there are depths of from 2 to 12 feet (0m6 to 3m7). The village of Chau Khe (Kheann) stands on the southern side of the entrance, and the village of Kieh Troc on the eastern bank, about 2¾ miles northward of the northern entrance point.

Vessels with local knowledge that can cross the bar will find good anchorage in a bend of the river near the southern entrance point.

Cap Chao (*Lat. 19° 43′ N., Long. 105° 53′ E.*), 255 feet (77m7) high, can be distinguished by a pagoda which stands on its northern slope and is visible from seaward. There is a sandy beach, which dries, on each side of the cape, where landing can be effected according to the prevailing monsoon. A shoal, with a depth of 2 feet (0m6) over it,

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Chart 2062.

lies in the small bight, about 6 cables westward of the cape. The village of Sam Son is situated on the coast northward of Cap Chao.

Lach Chao.—Storm signals.—Lach Chao (Lash Shao) is entered about 4 miles north-north-eastward of Cap Chao. Between the southern entrance point and a point on the coast about one mile south-south-westward, a bank, which dries about 6 feet (1m8), extends about 1½ miles offshore, and a similar bank extends about 8 cables eastward from the northern entrance point. The entrance, which is about 7 cables wide, is obstructed by a bar close off the outer end of these banks, with a depth of about 4 feet (1m2) over it, but it is subject to change. Between the entrance points the channel is about 2½ cables wide, with a depth of about 2 fathoms (3m7) in the fairway.

Thanh-Hoa, the principal town of the province of the same name, stands near the river, about 8 miles west-north-westward of the entrance.

When a typhoon is expected a red ball is displayed by day, and a *white* light is exhibited at night, from an iron framework mast situated at Sam Son.

Lach Truong.—Lach Truong (Lakh Tran) is entered about 6½ miles northward of Lach Chao, the coast between being low and sandy, with several villages. Nui Truong, 652 feet (198m7) high, steep and isolated, lies about one mile south-westward of the southern entrance point. Lach Truong is accessible at high water to vessels drawing 11 feet (3m4), but the depths are subject to change and no vessel should enter without local knowledge. The river can easily be entered during the North-east monsoon.

The entrance of Lach Truong is narrow. Hon Bo, 85 feet (25m9) high, lies near the extremity of a drying bank which extends about 3 cables east-north-eastward from the southern entrance point. Two rocks, which dry 3 and 4 feet (0m9 and 1m2), respectively, lie close eastward of Hon Bo. A drying bank extends about one mile east-south-eastward from the northern entrance point.

A rock, with a depth of 3 feet (0m9) over it, lies in the middle of the fairway, 2½ cables westward of the southern entrance point.

Off-lying islets.—Hon Né (*Lat. 19° 55′ N., Long. 106° 00′ E.*), 258 feet (78m6) high, lies about 2½ miles east-north-eastward of Hon Bo, near the southern edge of the coastal bank which extends southward from Cua Day (page 303).

Hon Sup, about 10 feet (3m0) high, lies about 9 cables eastward of Hon Bo; a rock, with a depth of 3 feet (0m9) over it, lies about one cable westward of Hon Sup.

Anchorages.—Directions.—A vessel can find temporary shelter from northerly winds southward of Hon Né, in a depth of about 3¾ fathoms (6m9).

Vessels with local knowledge can anchor southward of Hon Sup, in a depth of 3¾ fathoms (6m9).

There is anchorage in Lach Truong off the village on the southern side, about half a mile within the entrance, in a depth of about 1½ fathoms (2m7). Vessels should not enter without local knowledge.

NORTH-WESTERN SIDE OF GULF.—Coast.—From a point about 7 miles north-eastward of the mouth of the Lach Truong, a range of serrated mountains, with only a few prominent peaks, extends

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Chart 2062.

inland in a north-westerly direction for a considerable distance. North-eastward of this range is an extensive plain watered by Song Ca (Ka) and Thaï Binh. The mouths of the different branches of these two rivers form a delta which extends from the south-eastern end of the range of mountains, mentioned above, to Lach Huyen (Lakh Huen) (page 317), about 70 miles north-eastward. The rivers are connected with one another by many creeks and canals.

Shallow banks of mud extend from 8 to 10 miles in places off this part of the coast. The coast is flat, with trees here and there which appear to rise out of the sea, and vessels approaching should sound constantly. None of the river mouths should be attempted without a pilot.

Chart 1965.

Outlying island.—Île Bach (Bakh) Long Vi (*Lat. 20° 08′ N., Long. 107° 43′ E.*) lies about 100 miles east-north-eastward of the mouth of Lach Truong. Its summit is a plateau, 185 feet (56^{m}4) high, of which the slopes are precipitous in places, and, in others, covered with trees. It is fringed by a reef which extends 2 cables offshore in places, and a rocky bank, with depths of less than 3 fathoms (5^{m}5) over it, extends about three-quarters of a mile from its northern and southern ends. It should be given a berth of at least 2 miles.

A small vessel may find anchorage during the North-east monsoon, in a depth of 3½ fathoms (6^{m}4), off the southern side of the island with the south-western extremity, bearing 335°.

Shoals of fish are plentiful in the neighbourhood and have been mistaken for breakers.

Chart 1263.

Song Ca.—Song Ca or Fleuve Rouge has its source in the tableland of Yunnan, then flows through Hanoï and waters all the valley of Tonkin. Its principal tributaries are Riviere Noire, which also comes from Yunnan and enters the southern bank of Song Ca near Hung Hua, about 80 miles inland, and the Bo-de or Rivière Claire, which comes from the south-eastern corner of Yunnan and enters the northern bank of Song Ca, about 10 miles above Son Tai, situated about 75 miles inland.

Chart 2062.

About 15 miles above Hanoï (page 304), Song Ca divides into two branches, the southern of which is Lach Day (Lakh Dai). The northern branch, which retains the name Song Ca, again divides into several other branches, the principal of which enter the sea through Cua Lat Giang (Kua Lakh), Cua Ha Lan, Cua (Kua) Ba Lat, and Cua Tra Ly (Kua Trali). This portion of Song Ca is joined to Lach Day by several canals, of which the principal are Phu Ly and Nam Dinh canals.

Vessels of very shallow draught can ascend Song Ca as far as Lao-Kai on the borders of Yunnan where a considerable trade is developing.

The Bo-de is navigable for shallow draught vessels as far as Cho Bo, where there is communication, by boat, with Laishan, 200 miles above Hanoï, but from the end of June to the end of September, navigation is subject to interruption by sudden violent spates.

From December to May, Song Ca is at its lowest. About May, the melting of the snows in Upper Tonkin and Yunnan causes the river to rise rapidly, frequently washing away the banks. The annual rise at Hanoï (*Lat. 21° 02′ N., Long. 105° 50′ E.*) is from 16 to 20 feet (4^{m}9 to 6^{m}1).

Charts 2661a, 1263.

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Chart 2062.

The rate of flow in the lower reaches of the river system is often 2 or 3 knots ; in the upper reaches, above Hanoï, 4 to 5 knots is common in the high-river season. In the narrows during freshets, 7 to 8 knots may be reached. The influence of the tide on the flow is apparent up river almost as far as Hanoï during the low-river season and from the sea about half way to Hanoï in the high-river season.

Charts 1965, 2062.

Landmarks.—Caution.—Approaching the coast between Hon Né (page 301), and Cua Tra Ly (page 304), several clock towers, situated near the villages along the coast, can be seen. The tower of Saint Pierre in Quat Lam, situated on the coast about 30 miles north-eastward of the mouth of Lach Truong, is prominent and also the two towers of Thuc Hoa, about one mile farther north-eastward, which can be seen from a position eastward of Cua Ba Lat (page 304). There is a pointed clock tower at Hun Vi, 2 miles northward of Cua Ba Lat, and about 3 miles inland, which is prominent, and also two high towers of the church at Phu-Nho, situated about 7 miles inland.

When visibility is bad, the navigator will become aware of the proximity of the coastal bank, first by the reddish colour of the water and then by the breakers.

In 1947, vessels navigating between the parallels of latitude 20° N. and Hon Dau (page 307) were advised to approach the coast with caution when reaching depths of less than about 8½ fathoms (15m5), because of extensive alterations in the banks fronting Cua Ba Lat and Cua Tra Ly (*Lat. 20° 28′ N., Long. 106° 33′ E.*).

Cua Day.—Dangers.—Buoy.—Cua Day (Kua Dai), the mouth of Lach Day (Lakh Dai), lies about 11 miles north-eastward of the entrance to Lach Truong. Banks, which dry from 3 to 8 feet (0m9 to 2m4), extend about 8 miles southward from both sides of the entrance.

There is a narrow channel between the above-mentioned banks, but it is subject to change and the buoyage is frequently altered. A buoy is usually moored one mile from the south-eastern edge of the banks. There was, in 1949, a depth of less than one foot (0m3) on the bar.

Hon Né is a good mark when approaching the bar.

Vessels drawing 9 feet (2m7) can reach Hanoï by Lach Day. When the river is low, however, vessels cannot proceed farther than Phu Ly (Fu Li), a village situated about midway between the entrance and Hanoï.

Tidal streams.—In the approaches to Song Ca, normally the flow on the rising tide sets northward and on the falling tide southward. Strong cross currents have been reported in the vicinity of Cua Lach Giang and Cua Ba Lat. About 105°, 6 miles from Hon Né, the flow sets south to south-west and attains a rate of three-quarters of a knot on the rising tide and 1½ knots on the falling tide, at about half-tide ; it does not fall below half a knot.

About 088°, 12 miles from Hon Né, at neaps, the flow is rotary clockwise, being easterly at half a knot at high water, southerly at one knot at half-tide, veering to northerly at a quarter of a knot before high water.

About 7 miles east of Cua Ba Lat, with small tides, the flow sets in a northerly direction on the rising tide up to 1¾ knots. A little after high water it is practically slack.

Charts 2661a, 1263.

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Charts 1965, 2062.

Pilots.—Vessels should not enter Cua Day without local knowledge and, if proceeding to Hanoï, must embark a pilot at Nam Dinh, a town, about 25 miles northward of the entrance.

Chart 1965.

Cua Lac Giang.—Cua Ba Lat.—Buoyage.—Cua Lac Giang (Kua Lakh), about 5 miles eastward of Cua Day, and Cua (Kua) Ba Lat (*Lat. 20° 20′ N., Long. 106° 37′ E.*), about 25 miles north-eastward of Cua Lac Giang, are impracticable for sea-going vessels. A mud-bank, which dries about 5 feet (1m5), extends about 2 miles from the entrance to Lac Giang, and banks, which dry 4 feet (1m2), which are steep-to on their outer edges, extend about 6 miles from the entrance to Song Ca. Muddy water, having the appearance of banks of mud, extends a considerable distance offshore. As the cross currents in the vicinity are strong, and also on account of the absence of landmarks, these mouths should be given a wide berth by vessels passing.

There are two channels through the mudbanks fronting Cua Ba Lat, the southern of which was blocked in 1947. The northern channel, the entrance to which lies about 5 miles east-north-eastward of the eastern entrance point of Song Ca, had, in 1948, a depth of about 1½ feet (0m5) at its northern end ; it is sheltered by the banks and is available for boats with local knowledge except in heavy easterly and south-easterly swells.

The starboard side of the channel on entering was marked, in 1948, by three white buoys, the outer one of which was moored close seaward of the bar ; a similar buoy marked the northern side of the turning point into the river proper, at the junction of the two entrance channels.

Cua Tra Ly.—Off the mouths of Song Ca, Cua Tra Ly, about 10½ miles northward of the entrance to Song Ca, would appear to be the easiest of access to the main river, but the depths within decrease rapidly so that the junks which use it are obliged to stop and tranship their cargo in sampans.

Hanoï.—Hanoï, the seat of the Government of French Indo-China, stands on the western bank of Song Ca, about 100 miles from its mouths. There are wharves with a frontage of about 2,800 feet (853m4), with depths of 19½ feet (6m0) alongside.

In 1949, the population was 160,000, including 6,000 French.

Hanoï is connected to the general telegraph and railway systems.

Consul.—A British Consular officer is stationed at Hanoï.

Rivière Thaï Binh.—The tributaries of Rivière Thaï Binh have their source in the mountains which lie south-westward of the Chinese province of Kwangsi. As it flows through the plain, mentioned on page 302, Rivière Thaï Binh is divided into several branches, the principal mouths of which are Cua (Kua) Thaï Binh, Cua Van Uc (Kua Van Uk), Cua Lach Tray (Kua Trai), Cua Cam (Kua Kam), Cua (Kua) Nam Trieu and Lach Huyen (Lakh Huen). It is also connected with Song Ca by several canals, the two most important being Bac (Bak) Ninh or Canal des Rapides, and Cua Loc (Kua Lok) or Canal des Bambous.

All the trade of this district passes through Haïphong, situated about 6 miles above the entrance of Cua Cam (page 310).

Cua Thaï Binh.—Cua Thaï Binh lies with its entrance about 9½ miles north-north-eastward of Cua Tra Ly. A bank, which dries 5 feet (1m5) in places, and with detached patches, which dry, close off

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Chart 1965.

its outer edge, extends about 4½ miles east-south-eastward from the southern entrance point, and a bank, which dries about 3 feet (0m9), extends about 2½ miles south-eastward from the northern entrance point, situated about 3 miles east-north-eastward of the southern entrance point. The channel into the river lies between these two banks and the bar, over which there is a depth of about 5 feet (1m5), lies from 2½ to 5 miles south-eastward of the entrance.

The bar is rendered dangerous by the absence of navigational marks.

The river within is navigable by vessels drawing 14 feet (4m3).

From a position southward of Cua Thaï Binh.
(*Original dated* 1933.)

The north-eastern end of Cua Loc enters the western bank of the river about 14 miles above the entrance, and, farther northward, Canal des Riz connects Thaï Binh with Song Van Uc.

Rivière Thaï Binh and Song Van Uc are again connected by Gua canal, about 8 miles above the entrance of Cua Loc.

Haï Duong (Dzung), the capital of the province of the same name, stands on the western bank of Rivière Thaï Binh, about 26 miles north-westward of the southern entrance point.

The eastern end of Bac Ninh canal enters the western bank of Rivière Thaï Binh, about 11 miles above Haï Duong (*Lat. 20° 57′ N., Long. 106° 19′ E.*).

Cua Van Uc.—Buoy.—Cua Van Uc (Kua Van Uk), about one mile wide at its entrance, leads into Song Van Uc and lies at the head of a bight between the northern entrance point of Cua Thaï Binh and Petit Mirador, 231 feet (70m4) high, the south-eastern extremity of Presqu'île de Do Son, about 7½ miles north-eastward. A bank, which dries from one to 3 feet (0m3 to 0m9), extends three-quarters of a mile from the head of the bight, and a detached bank, which dries about 3 feet (0m9), extends about 3 miles southward from a position about 4 cables southward of the eastern entrance point of Cua Van Uc.

The channel leading to the entrance of Cua Van Uc lies between the detached bank and the bank extending from the northern entrance point of Cua Thaï Binh. The bar, over which there is a depth of about 3 feet (0m9), extends from 3 to 5 miles south-eastward of the entrance. The depths increase within the bar.

A black can buoy is moored off the entrance to Cua Van Uc, about 5 miles south-south-eastward of the southern entrance point.

Owing to Gua canal the shortest passage to Haï Duong is by Song Van Uc. Lach Tray (Trai), which flows into Cua Cam, is connected to the north-eastern bank of Song Van Uc about 1¾ miles below Gua canal.

Chart 3875.

Landmarks.—There are several hills inland which assist in distinguishing Cua Thaï Binh and Cua Van Uc and also the other mouths of Rivière Thaï Binh situated farther north-eastward. Nui Voï (chart 1965), 520 feet (158m5) high, lies about 17 miles north-westward of Petit Mirador. Nui Phu Lien, 444 feet (135m3) high, lies about

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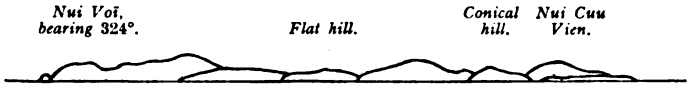
Chart 3875.

3¾ miles south-eastward of Nui Voï. A peak, on which is the prominent observatory of Phu Lien, lies about one mile north-eastward of Nui Phu Lien, and Nui Cuu Vien, 372 feet (113m4) high, lies about three-quarters of a mile farther north-eastward. Nui Dao Son, which has three peaks, the highest of which has an elevation of 474 feet (144m5), lies about 9 miles north-north-eastward of Nui Phu Lien. Two hills, each of which is 159 feet (48m5) high, and which are three-quarters of a mile apart in a north-easterly direction, lie nearly midway between Nui Phu Lien and the entrance of Cua Van Uc ; the north-eastern of these two hills is cone-shaped and the other is flat.



From a position south-eastward of Cua Van Uc.
(*Original dated* 1933.)

Climatic table.—*See* page 58.

Tidal streams.—Between the mouths of Rivière Thaï Binh, (page 305) and Haï Duong, the outgoing tidal stream generally attains a rate of from half a knot to one knot. In the narrow part of the river between Haï Duong and the junction of Bac Ninh canal the rate is from 1½ to 2 knots.

Note.—The remaining mouths of Rivière Thaï Binh are described on pages 310-318.

HAÏPHONG AND APPROACHES.—Haïphong, situated about 13 miles north-westward of Petit Mirador, is approached between Presqu'île de Do Son and Îles Norway, two groups of inaccessible islands, about 18½ miles eastward. *See* view on chart 1965.

Île de la Cac Ba lies on the north-eastern side of the approach, about 7 miles north-westward of Îles Norway, and there are several islets and dangers between them.

Two channels lead to Haïphong: Cua Cam, which lies north-eastward of Presqu'île de Do Son, and Cua Nam Trieu, about 3 miles farther north-eastward. These channels are joined to one another by a canal cut through Île de Dinh Vu, which lies between them. Cua Nam Trieu is the principal channel, and vessels proceeding to Haïphong pass through the canal into Cua Cam. Haïphong (*Lat. 20° 52′ N., Long. 106° 40′ E.*) stands on the southern bank of Cua Cam, about 4 miles above the canal.

In 1947, a depth of about 12 feet (3m7) could be carried over the bar at the entrance to Cua Nam Trieu.

South-western side of approach.—Presqu'île de Do Son.—Presqu'île de Do Son is hilly and attains an elevation of 405 feet (123m4) in Grand Mirador, about 2½ miles north-westward of Petit Mirador. The town of Do Son, the watering place of Haïphong and connected to the general telegraph system, is situated in the north-eastern part of the peninsula. Between Petit Mirador and Pointe Do Son, about 3 miles northward, there are two bays, the northern of which is Baie des Pilotes, separated from one another by a hill, 212 feet (64m6) high. A group of rocks, some of which dry 4 feet (1m2), lies about 3½ cables northward of Petit Mirador, and, from a point on the

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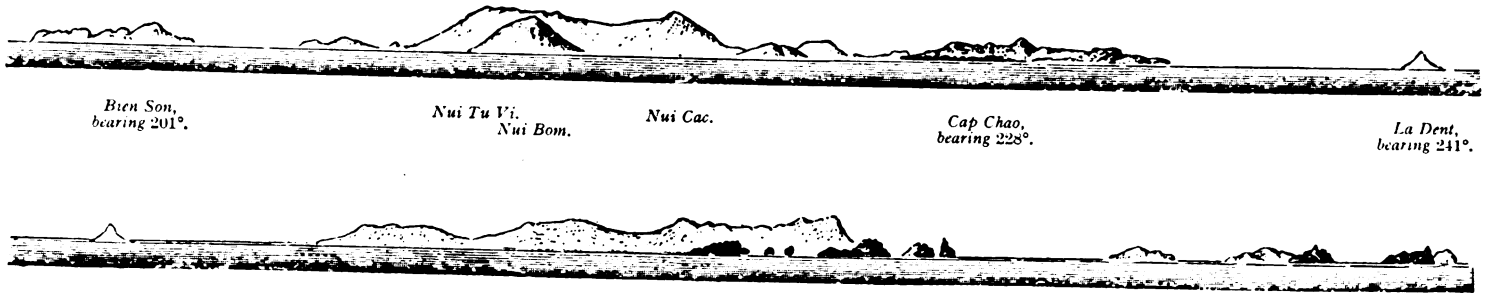
To face page 307.



View, in two parts, of coast from a position about 9½ miles north-eastward of Cap Chao.

(*Original dated* 1930.)

Îles Norway from southward, distant 3 miles.

(*Original dated* 1932.)

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Chart 3875.

coast about half a mile southward of Pointe Do Son, a reef extends 2 cables eastward.

There is a pier, about 490 feet (149m3) long, at Petit Mirador.

Storm signals.—Storm signals are shown from a flagstaff at Petit Mirador. *See* page 18.

Off-lying islet.—Light.—Beacon.—Hon Dau lies about half a mile south-eastward of Petit Mirador. In addition to the lighthouse, there is a flagstaff and a pilot station on the islet, which is in communication with Haïphong.

A rock, which dries and is marked by a beacon, lies nearly midway between Hon Dau and Petit Mirador (*Lat. 20° 40′ N., Long. 106° 48′ E.*).

A light is exhibited, at an elevation of 203 feet (61m9), from a grey octagonal conical tower, about 66 feet (20m1) in height, on Hon Dau.

North-eastern side of approach.—Islands and dangers.—Light.—Îles Norway consist of two main groups of high and inaccessible islands and rocks, separated by a channel about 1½ miles wide. Norway Est, 225 feet (68m6) high, the largest island in the eastern group, lies about 22 miles east-south-eastward of Hon Dau. Several islets and rocks lie off the north-eastern side of Norway Est, the outer ones at a distance of a quarter of a mile, and it is a natural landfall for vessels bound for ports in the north-western part of Tongking gulf. La Tour, a pointed rock, lies about 3¼ cables northward of Norway Est.

Grande Norway, the largest island of the western group, and on which is a lighthouse, lies about 2¼ miles westward of Norway Est. Grande Norway has a creek on its eastern side which affords shelter to small craft at high water.

A light is exhibited, at an elevation of 361 feet (110m0), from a grey circular masonry tower, and dwelling, about 98 feet (29m9) in height, on the eastern side of Grande Norway.

Roche du Tjalatjap, with a depth of 9 feet (2m7) over it, lies about 1½ cables north-eastward of the northern extremity of Grande Norway. A small group of islets lies about half a mile south-eastward of Grande Norway. Le Bonnet, a rock, 41 feet (12m5) high, lies about 2 cables south-westward, and Le Menhir, a rock, lies about 1¼ cables south-eastward of this small group. A rock, which dries 7 feet (2m1), lies about three-quarters of a cable west-south-westward of Le Bonnet, and a shoal patch, with a depth of 2 feet (0m6) over it, lies about 1½ cables northward of Le Menhir. Île Haute, 313 feet (95m4) high, with a rocky patch, having a depth of 1½ fathoms (2m7) over it, about one cable off its western side, lies about half a mile south-westward of Grande Norway.

A chain of islets and rocks lies from 3 cables to one mile north-westward of Île Haute (*Lat. 20° 37′ N., Long. 107° 09′ E.*), with Roche Noire, 3 feet (0m9) high, about midway between the north-western end of the chain and Grande Norway. Île Ouest, 251 feet (76m5) high, the westernmost of Îles Norway, lies 8½ cables westward of Île Haute. *See* view on chart 1965 and view facing this page.

Fausse Quille, a pointed rock, is the easternmost of a group of three rocks lying about 2 miles north-westward of Grande Norway. A bank, with depths of less than 6 fathoms (11m0) over it, extends about 1¼ cables northward, and a 2-fathom (3m7) patch lies about 1¼ cables south-eastward of Fausse Quille. Rocher Pointu, the southernmost

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Chart 3875.

of this group, with another rock about half a cable north-westward of it, lies about 2½ cables south-westward of Fausse Quille. A rocky ledge, with a depth of 2 feet (0m6) over it, extends one cable north-westward from the north-western rock, and a ledge, with a depth of less than 6 feet (1m8) over it, extends one cable north-eastward from Rocher Pointu.

Rocher du Large, 51 feet (15m5) high, lies about 3 miles westward of Fausse Quille, in the southern approach to Baie de Lan Ha (page 320); a rocky ledge, with a depth of 12 feet (3m7) over it, extends about one cable southward from Rocher du Large. A patch, with a depth of 32 feet (9m8) over it, lies about half a mile south-westward, and a rock, with a depth of 8 feet (2m4) over it, lies about 3 cables north-north-westward of Rocher du Large.

Basse du Passage, a rocky shoal, with a depth of 28 feet (8m5) over it, lies about 1¾ miles north-westward of Rocher du Large. Grande Norway lighthouse, bearing less than 110°, and well open southward of Rocher du Large, leads southward of Basse du Passage.

Île de la Cac Ba.—Off-lying islets and dangers.—Île de la Cac Ba lies on the north-eastern side of the approach to Haïphong. A range of mountains, the summit of which is about 1,140 feet (347m5) high, lies near the western side of the island. At the southern end of the island there is a peninsula, on the summit of which, 471 feet (143m6) high, is a prominent fort, situated about three-quarters of a mile north-eastward of the southern extremity of the island. Between Basse du Passage and the southern extremity of the island are several high and rocky islets, the southernmost of which is La Quille, a rock, 136 feet (41m4) high; a rock, with a depth of 22 feet (6m7) over it, lies about 1¾ cables eastward of La Quille, and a rocky shoal, with a least depth of 20 feet (6m1) over it, lies about 6 cables south-south-eastward of La Quille. Vessels are recommended not to pass between La Quille and this shoal.

Les Oreilles, an islet, lies about one cable northward of La Quille. A rock, with a depth of 2 feet (0m6) over it, lies about three-quarters of a cable eastward, and a rocky ledge, with a depth of 9 feet (2m7) over it, extends about one cable north-westward from Les Oreilles.

Roche Trident, with a depth of 6 feet (1m8) over it, lies about one mile west-south-westward of Les Oreilles. L'Osselet, 31 feet (9m4) high, about 1½ miles north-north-westward of Roche Trident, bearing 358°, in line with Île F, about half a mile northward, leads about 8 cables westward of Roche Trident.

La Larme (*Lat. 20° 42′ N., Long. 107° 02′ E.*) is an islet lying on a rocky bank about 3½ cables northward of Les Oreilles; there is an 8-foot (2m4) patch about one cable north-eastward of the islet; a rock, with a depth of less than 6 feet (1m8) over it, lies about 1½ cables westward of the northern extremity of the islet.

Three islets, the positions of which can best be seen on the chart, lie between La Larme and the southern extremity of Île de la Cac Ba which forms the eastern entrance point of Baie d'Apowan (page 309), about 7 cables northward.

Île H, 320 feet (97m5) high, lies in the southern approach to Baie d'Apowan, about 2 cables north-westward of La Larme.

The islets lying off the south-eastern side of Île de la Cac Ba, in the approach to Baie de Lan Ha, are described on pages 321-322.

Charts 1965, 2062, 2661a, 1263.

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Chart 3875.

Île B, 408 feet (124m4) high, with Îlot E, 153 feet (46m6) high, close southward, lies about 6 cables westward of Île H. Several islets extend about 3 cables from the south-eastern end of Île B. Three islets lie within one mile north-westward of Île B. Île F, the middle one, is 326 feet (99m4) high, and Le Penseur is the north-westernmost.

Between the western entrance point of Baie du Bengali, which rises to an elevation of 346 feet (105m5), about half a mile north-westward of Le Penseur, and the north-western extremity of a peninsula, 2¾ miles north-westward, the south-western side of Île de la Cac Ba is indented by small bays separated from one another by hilly promontories. Morne D, 277 feet (84m4) high, the summit of the above-mentioned peninsula, lies about three-quarters of a mile south-eastward of its north-western extremity. Between the peninsula and the coast north-eastward there is a shallow bay.

A large number of islands lie close off the western side of Île de la Cac Ba, westward of which is a swamp terminating in Pointe des Pirates, situated about 6 miles north-westward of Morne D.

The northern and the north-eastern sides of Île de la Cac Ba are described on pages 324-330.

Anchorage.—Vessels awaiting the tide should anchor as near Hon Dau as their draught will admit. If there is a heavy swell, vessels are recommended to anchor in Baie d'Apowan, which is available for vessels drawing 19 feet (5m8).

Pilots.—Pilots can be obtained at Hon Dau (*Lat. 20° 40′ N., Long. 106° 49′ E.*). Their motor-boat is painted white and displays the pilot flag (*see* page 32). Pilotage is compulsory for merchant vessels. *Charts 3875, 1965.*

Directions.—A vessel bound for Haïphong should make Îles Norway. When approaching these islands in thick weather or at night, caution should be observed as soon as the depth becomes less than 16 fathoms (29m3). Eastward of the group, the bottom consists of greyish mud.

If approaching from southward in thick weather the vessel should make Hon Dau. With this island bearing 343° the bottom consists of muddy sand. North-eastward of this line of bearing, the bottom is white or grey sand with black speckles. South-westward of the same line, as far as the meridian of Hon Dau, the bottom is almost all mud, often mixed with shells; also the depths rapidly decrease from 16 to 14 fathoms (29m3 to 25m6), and the bottom then consists of red brick-coloured mud only. Farther westward the mud becomes of a more reddish colour.

With bad visibility, if a vessel considers that she is too far westward she is recommended to anchor as soon as she is in a depth of 8 fathoms (14m6). On ascertaining that such is the case, she should steer eastward, into a depth of 11 fathoms (20m1), and then northward, into a depth of 6 fathoms (11m0), when she will have a better chance of sighting Hon Dau.

Chart 3875.

Baie d'Apowan.—Baie d'Apowan lies between the southern extremity of Île de la Cac Ba and the group of rocky islands about one mile westward. The bay is shallow and its shores are indented. For 8 months of the year the bay is frequented by numerous fishing junks. The islands lying in the approach to the bay are described on pages 308-309.

Charts 2062, 2661a, 1263.

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Chart 3875.

Foul ground extends about 3 cables south-westward from the eastern entrance point of the bay. About three-quarters of a mile west-north-westward of this point is an islet, 261 feet (79m5) high, with a rock, with a depth of 1¾ fathoms (3m2) over it, lying close off its western side, and another islet about 1½ cables northward. A rocky patch, with a depth of 10 feet (3m0) over it, lies about 2 cables southward of the 261-foot (79m5) islet.

Anchorage.—Directions.—During the North-east monsoon, vessels drawing 19 feet (5m8) will find good anchorage, open south-westward, in Baie d'Apowan, in a depth of 23 feet (7m0).

Within the entrance the depths decrease gradually towards the village of Apowan, in which there is a Custom house with a prominent white tower situated at the north-eastern end of the bay.

Near the Custom house is a stone jetty, available for boats at low water, but care should be taken to avoid the sunken rocks near it.

Fresh provisions can be obtained.

Cac Ba radio station is situated at Apowan ; correspondence with it is restricted to requests for pilots.

To enter Baie d'Apowan, a vessel should keep the north-western extremity of Île H (*Lat. 20° 42′ N., Long. 107° 02′ E.*) in line with the Custom house at Apowan, bearing 043°, thence altering course to pass about half a cable north-westward of that island ; thence she should steer for the village and anchor according to draught in very soft mud.

Vessels with local knowledge, drawing less than 14 feet (4m3), can enter from south-eastward, between the islets which extend southward from the eastern entrance point.

Baie du Bengali.—Baie du Bengali, which is shallow, with an islet and some rocks, which dry, on its western side, is entered between the point situated half a mile north-westward of Le Penseur (page 309) and a point three-quarters of a mile eastward.

Cua Cam.—Lights.—Buoys.—Cua Cam (page 304) was formerly the only route to Haïphong but, owing to silting, it is now only used by small vessels. It has two bars, the outer one, of hard mud, lies northward of Pointe do Son, and the other, of soft mud, lies between the two southernmost light-structures (*see* below). Above these bars, Cua Cam is navigable by vessels with a draught of 10 feet (3m0) for 30 miles above Haïphong, where it connects with Rivière Thaï Binh.

A light is exhibited, at an elevation of 25 feet (7m6), from a black beacon, about 48 feet (14m6) in height, situated about one mile north-north-westward of Pointe Do Son. The light was extinguished in 1949.

A light is exhibited, at an elevation of 30 feet (9m1), from a red structure, about 56 feet (17m1) in height, situated about 3¾ miles north-north-westward of Pointe Do Son. The light was extinguished in 1949.

A light is exhibited, at an elevation of 28 feet (8m5), from a black hut beacon standing on piles, about 60 feet (18m3) in height, situated about 6¾ miles north-westward of Pointe Do Son. The light was extinguished in 1949.

A red buoy, No. 2, is moored about three-quarters of a mile eastward of Pointe Do Son.

A black buoy, No. 1, is moored about 2½ miles northward of Pointe Do Son.

Charts 1965, 2062, 2661a, 1263.

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Chart 3875.

The lights and buoys farther up river are described on pages 313-314.

Cua Lach Tray, leading into Song Lach Tray, is entered about 5½ miles north-westward of Pointe Do Son.

Canal Maritime (page 312), cut through the middle of Île de Dinh Vu, enters Cua Cam about 8 miles north-north-westward of Pointe Do Son. An embankment, about 1,000 yards (914m4) long, has been constructed on the western side of Cua Cam, about 3 cables south-westward of the north-western end of this canal.

That portion of Cua Cam which lies between Canal Maritime and Haïphong (page 314), is described on page 313.

Cua Nam Trieu.—Lights.—Buoyage.—Cua Nam Trieu is entered between the south-eastern extremity of Île de Dinh Vu, situated about 6 miles northward of Pointe Do Son, and the south-western extremity of Île de Ha Nam, which separates Cua Nam Trieu from Lach Huyen, about 3 miles south-eastward. A bank, which dries from one to 6 feet (0m3 to 1m8), extends about 4½ miles south-eastward from the western entrance point, and a detached bank, which dries from about one to 3 feet (0m3 to 0m9), lies about half a mile farther south-eastward. A bank, which dries from one to 3 feet (0m3 to 0m9), extends about 2¼ miles south-eastward from the eastern entrance point.

A channel, in which there was a depth of 20 feet (6m1), was dredged through the bar in 1926, and vessels with a draught of 26 feet (7m9) could enter at high water ; in 1950, however, there was a least depth of 11½ feet (3m6) over the bar. The bottom consists of hard sandy mud, and it is therefore necessary to take the scend of the sea into consideration before entering this channel. It was reported, in 1935, that the north-eastern side of the dredged channel was steep-to, and that the depths decreased gradually south-westward. The depths increase above the bar and vessels can proceed to Haïphong through the Canal Maritime, the south-eastern end of which is situated about 3¼ miles north-westward of the western entrance point of Cua Nam Trieu.

Leading lights are situated at the entrance to Cua Nam Trieu ; the front mark consists of two lights, vertically disposed, at elevations of 22 and 27 feet (6m7 and 8m2) from a white hut on black piles, about 53 feet (16m2) in height, situated about 3¾ miles north-eastward of Pointe do Son (*Lat. 20° 43′ N., Long. 106° 48′ E.*) ; the rear mark, consisting of two lights, vertically disposed, which are exhibited at elevations of 72 and 68 feet (21m9 and 20m7), respectively, from a black pylon on piles, about 89 feet (27m1) in height, is situated about 1½ miles west-north-westward of the front light. These lights in line, bearing 303½°, lead through the dredged channel over the bar.

The north-eastern side of the channel is marked by light-buoys and buoys, moored parallel with, and half a cable north-eastward of, the axis of the channel. The outer buoy, known as Zero buoy, is a light-buoy painted red, exhibiting a *white flashing* light of *two seconds* duration *every eight seconds*, and is moored about 6¼ miles south-eastward of the front bar leading light-structure. The channel over the bar is subject to change and the buoyage is altered accordingly. The north-eastern side of the channel is marked by buoys and light-buoys, all painted red, moored at intervals north-westward of Zero buoy ; No. 2 is surmounted by a diamond ; Nos. 4 and 18 exhibit a *white fixed* light ; Nos. 6, 8, 10, 12, 14, and 16 exhibit a *green fixed*

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Chart 3875.

light. The south-western side is marked by black conical buoys; Nos. 1, 3, 5, 7 and 11 exhibit a *red fixed* light, and No. 9 is surmounted by a reflector. The positions of these light-buoys and buoys can best be seen on the chart.

Leading lights are situated on the north-eastern side of Cua Nam Trieu. The front light is exhibited, at an elevation of 26 feet (7m9), from a red hut on white piles, about 51 feet (15m5) in height, about three-quarters of a mile north-eastward of the western entrance point of Cua Nam Trieu. The rear light is exhibited, at an elevation of 84 feet (25m6), from a white pylon with black bands, about 87 feet (26m5) in height, about 1¾ miles north-westward of the front light. These lights in line, bearing 331°, lead from the inner end of the channel dredged through the bar towards the first bend of the river.

In 1938, fishing stakes extended from both sides into, and restricted the width of, the navigable channel between positions about 3 miles south-eastward, and 1½ miles north-westward, of the south-eastern extremity of Île de Dinh Vu. Vessels must strictly adhere to the leading line in consequence.

A light marks a stranded wreck on the northern side of the channel, about half a mile westward of the front leading light of the inner alignment.

A light is exhibited on the southern side of the river, at an elevation of 17 feet (5m2), from a black hut on white piles, about 43 feet (13m1) in height, about 1¼ miles west-north-westward of the western entrance point and half a mile from the southern bank.

Chart 3010, plan of Port of Haïphong.

Canal Maritime.—Lights.—Canal Maritime or Dinh Vu cutting is about 7 cables long, and, in 1950, there was a least depth of 22 feet (6m7) at the western end; the depths decrease to 15 feet (4m6) in Cua Cam on the leading line (*see* page 313), about 4½ cables farther westward. In 1947, the displacement of vessels using the canal was limited to 3,000 tons and the maximum speed permitted was 5 knots.

A light is exhibited, at an elevation of 41 feet (12m5), from a red column on a red platform on piles, about 64 feet (19m5) in height, close off the northern entrance point of the south-eastern end of the canal (*Lat. 20° 51′ N., Long. 106° 45′ E.*).

A light is exhibited, at an elevation of 41 feet (12m5), from a tripod, painted with black and white horizontal bands, and surmounted by a triangle, about 40 feet (12m2) in height, on the southern entrance point of the south-eastern end of the Canal Maritime. In 1945, this light was extinguished.

A light is exhibited, at an elevation of 49 feet (14m9), from a red structure on piles, about 61 feet (18m6) in height, on the northern entrance point of the north-western end of Canal Maritime.

Northward of Canal Maritime, Cua Nam Trieu becomes the Song Bach Dang (page 315).

Regulations.—Vessels can pass through the canal by day or night.

When two vessels are approaching each other in opposite directions, the one from Cua Nam Trieu must wait and, if necessary, anchor until the one from Cua Cam has passed through.

When dredgers are at work, vessels approaching must sound their whistles or syrens repeatedly.

Vessels must not pass a dredger until the latter has displayed the

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Chart 3010, plan of Port of Haïphong.

signal " Not under control " at half mast, indicating that the channel is clear, and one of the two following signals :—

(*a*) A cone, point up, by day, or two *green* lights, disposed vertically, by night, indicating that the dredger must be passed on the starboard hand.

(*b*) A cone, point down, by day, or two *red* lights, disposed vertically, by night, indicating that the dredger must be passed on the port hand.

Vessels passing a dredger must do so as slowly as possible, and must stop if necessary.

The Captain of the Port of Haïphong should be informed by radio as soon as possible of the date and hour of arrival.

Local steamers generally arrange to arrive at Haïphong at slack water or at the end of the flood stream.

Cua Cam between Canal Maritime and Haïphong.—Lights.—Beacons.—Buoyage.—The western end of Van Chau, a branch of the river which connects Cua Cam with Cua Nam Trieu, enters the northern side of Cua Cam between the western extremity of Île de Dinh Vu, situated about 3 miles west-north-westward of Canal Maritime, and a point about 5½ cables westward. Mudbanks, which dry, extend from both these entrance points, leaving a channel about half a cable wide. The banks of Van Chau are covered at high water ; the edge of the drying bank, north-westward of the north-western extremity of Île de Dinh Vu, is marked by beacons.

Haïphong (*Lat. 20° 52′ N., Long. 106° 41′ E.*) is situated on the southern side of Cua Cam, about 1½ miles west-south-westward of the western end of Van Chau. Abreast Haïphong there were, in 1944, depths of from 7 to 9 fathoms (12^{m}8 to 16^{m}5). The mouth of Song Tam Bac, which is not navigable, is situated on the southern side of Cua Cam, close westward of Haïphong, and the entrance to Ha Ly cutting, dredged to a depth of 8 feet (2^{m}4), and which leads into Song Tam Bac above Haïphong, is situated on the same side of the river about 4 cables west-north-westward of the mouth of Song Tam Bac.

The channel between Canal Maritime and Van Chau is marked by buoys in accordance with the French system. *See* page 26.

Leading beacons, about 2 cables apart, are situated on the south-western bank of the river about 2 miles north-westward of the north-western entrance of Canal Maritime. These beacons, in line, bear 293° and lead out of the canal.

A light is exhibited, at an elevation of 32 feet (9^{m}8), from a black pylon, with a white dwelling, situated about half a cable off the south-western bank of the river close southward of the alignment of the above leading beacons and about 6 cables south-eastward of the front beacon of that alignment.

Leading beacons, about 2¾ cables apart, are situated on the eastern side of the entrance to Van Chau, and in line bear 315°.

A black tower stands on the edge of the drying bank on the eastern side of the entrance to Van Chau, about 2 cables westward of the front leading beacon.

Leading lights are situated on the western side of the entrance to Van Chau. The front light is exhibited, at an elevation of 28 feet (8^{m}5), from a post on a red hut on piles, about 47 feet (14^{m}3) in height, near the western entrance point of Van Chau. The rear light is exhibited,

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Chart 3010, plan of Port of Haïphong.

at an elevation of 30 feet (9m1), from a tripod, painted with black and white bands, 2 cables west-north-westward of the front light. These lights in line bear 299°.

There are several mooring buoys between the entrance to Van Chau and the entrance to Ha Ly cutting.

A black buoy is moored off the eastern side of the entrance to Van Chau, about one cable eastward of the front leading light on the western side of the entrance.

A light is exhibited, at an elevation of 32 feet (9m8), from a black tripod, about 55 feet (16m8) in height, on the edge of the drying shore bank about one cable northward of the eastern entrance point of Ha Ly cutting.

Tidal streams.—In Cua Nam the flow may attain a rate of 2½ knots. In Cua Nam Trieu, about one mile below the entrance to Canal Maritime, the flow turns about 2½ hours after high water and 1½ hours after low water at Cua Cam (*see* predictions in Admiralty Tide Tables). With large tides the outflow exceeds 3 knots.

In Song Kinh Thai at Haïphong during the low-river season (October to February) :—(*a*) With small tides the out-going stream commences 2 hours after high water at Cua Cam and the in-going 2½ hours after low water there. The maximum rates are about 1½ knots and one knot, respectively. (*b*) With large tides the out-going stream commences 3½ hours after high water at Cua Cam and the in-going 6½ hours after low water there. The maximum rates are from 2 to 4 knots and from 2 to 3 knots, respectively.

During the high-river season (summer) the in-going flow is reduced and the out-going flow increased in both speed and duration ; there is no in-going flow at all if the tidal range is less than one foot (0m3). The out-going flow has been observed to reach 4 to 5 knots after heavy rain and vessels frequently drag.

The in-going stream becomes established slowly ; for the first half hour its rate does not exceed half a knot and this is followed by a slack water period of from one to 1½ hours before the stream is properly established. The out-going stream gets going rapidly, beginning in the middle of the river. It attains a rate of one knot within an hour of commencement.

Haïphong.—Haïphong (*Lat. 20° 52′ N., Long. 106° 41′ E.*) has the appearance of a European town and is the shipping port of Hanoï, Haï Duong and Nam Dinh, commercial centres of Tonkin. In 1949, the population was about 115,300.

Berthing.—There are six berths for large vessels alongside the wharves, which are curved, and where the depths, in 1949, were from 18 to 23 feet (5m5 to 7m0), and eight berths, with a depth of 23 feet (7m0), in which vessels up to 300 feet (91m4) long can be secured to buoys.

Small vessels can secure alongside two wharves situated northward of the hospital and northward of the Residency.

In 1946, the wharves were in bad condition and encumbered with broken trucks, etc., making transport difficult and it was considered that, provided lighters could be obtained, cargo would be more speedily discharged from a vessel at a buoy.

In addition to these positions, vessels can moor above Ha Ly cutting as close to the northern bank as possible, in order to keep the channel

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Chart 3010, plan of Port of Haïphong.

clear. The bottom is clay and anchors do not sink far into it. The holding ground is good, even in heavy squalls.

Storm and other signals.—There is a signal station with which vessels can communicate by means of the International Code of Signals.

Storm signals are shown at the signal station flagstaff (*see* page 18).

Port facilities.—A few fresh provisions may be obtained. Fresh water is supplied at the wharves, but, in 1946, the supply was uncertain.

A small quantity of coal can be obtained.

Repairs to hulls and machinery can be effected.

At the main wharf, which is connected to the railway system, there are two cranes with lifting capacities of 2 and 4 tons, respectively.

In 1946, five tugs and 140 lighters, with capacities of from 20 to 100 tons, were available.

There is a hospital at Haïphong, to which patients can be admitted on application to the medical authorities.

Deratisation.—For deratisation, *see* page 35.

Trade.—Shipping.—The principal exports are coal, tin, zinc ore, rice and cement; the chief imports are machinery oil, motor spirit, preserved goods, wines and spirits.

In 1948, 218 vessels, of 385,000 tons, entered Haïphong.

Communication.—Haïphong is connected to the general railway and telegraph systems.

There is communication with Hanoï by inland waterways.

Regulations.—Vessels arriving are berthed by the Captain of the Port and are given a copy of the Port regulations.

Chart 3010, plan of Port of Haïphong, 3875.

Song Bach Dang. — Lights. — Beacons. — Buoys. — Abreast the eastern entrance of Canal Maritime, Cua Nam Trieu trends northward and becomes Song Bach Dang. The eastern end of Van Chau enters the western side of Song Bach Dang about 2 miles north-north-westward of Canal Maritime.

A light is exhibited, at an elevation of 30 feet (9^{m}1), from a red pylon, with a white dwelling, on piles, on the northern side of the eastern entrance to Van Chau (*Lat. 20° 53′ N., Long. 106° 45′ E.*). Both entrance points are marked by beacons.

Chart 3875.

Bancs de Ha Nam, which are rocky, extend about three-quarters of a mile from the western bank of the river about 2½ miles north-north-eastward of the eastern entrance to Van Chau, leaving a narrow channel on their eastern side. The shoalest part, which dries 4 feet (1^{m}2), is marked by a conical masonry beacon, painted in black and white bands and surmounted by a sphere. A spit, with depths of less than 3 fathoms (5^{m}5) over it, extends about 2½ cables southward from the beacon. A rock, above water, with a rock, awash, about 2 cables southward of it, lies about 1½ cables north-westward of the beacon, and a bank, with depths of less than 3 fathoms (5^{m}5) over it, extends over one mile south-south-westward from the rock above water.

A black conical buoy, surmounted by a cylinder, marks the western side of the channel about 2 cables north-north-eastward of the black and white beacon.

A conical masonry tower, lower half black and upper half pink, stands on the eastern side of the channel eastward of Bancs de Ha Nam, about 2½ cables eastward of the black and white beacon.

Charts 1965, 2062, 2661a, 1263.

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Chart 3875.

A light is exhibited, at an elevation of 31 feet (9m4), from a black quadrangular pylon, with a white dwelling, about 43 feet (13m1) in height, near the eastern bank of the river, about 4 cables eastward of the beacon on Bancs de Ha Nam. This light, used as a rear light in line, bearing 157°, with the front leading light of the Bancs de Ha Nam 022° alignment, given below, leads in the river northward of these banks.

Leading lights are situated north-eastward of Bancs de Ha Nam. The front light is exhibited, at an elevation of 20 feet (6m1), from a white pylon with black bands surmounted by a diamond, about 43 feet (13m1) in height, situated about 4 cables north-eastward of the beacon on Bancs de Ha Nam. The rear light is exhibited, at an elevation of 45 feet (13m7), from a white triangular concrete pylon with black bands, about 49 feet (14m9) in height, situated about 3½ cables north-north-eastward of the front light. These lights in line bear 022°, and lead through the southern part of the channel eastward of Bancs de Ha Nam.

No. 9 light-buoy, painted black, and exhibiting a *red fixed* light, marks the north-eastern edge of the shoal with a depth of 2 fathoms (3m7) over it, about 5½ cables north-north-eastward of the beacon on Bancs de Ha Nam. A detached 17-foot (5m2) patch lies 8 cables northward of the same beacon.

The western end of Song Chang, which connects Song Bach Dang with Lach Huyen, lies on the eastern side of the river about 5 miles northward of Canal Maritime.

Leading lights are situated on the eastern side of the river northward of the western entrance to Song Chang. The front light is exhibited, at an elevation of 29 feet (8m8), from a red column and platform on piles, about 47 feet (14m3) in height, situated about 4 cables north-westward of the northern entrance point of Song Chang and 1½ cables offshore. The rear light is exhibited, at an elevation of 41 feet (12m5), from a white tripod with black bands, about 56 feet (17m1) in height, situated about 3¼ cables northward of the front light and close offshore. These lights in line, bearing 002°, lead through the middle part of the channel eastward of Bancs de Ha Nam.

Seven light-beacons mark the dredged channel in Song Chang.

The town of Quang Yen (*Lat. 20° 56′ N., Long. 106° 48′ E.*) stands on the northern bank of Song Chang about 1¼ miles eastward of its western entrance and a short distance inland. There is a jetty at the town, and a narrow channel, in which there is a depth of 7 feet (2m1), has been dredged from the western entrance to a short distance eastward of the jetty. Vessels with local knowledge, drawing 16 feet (4m9), can anchor in Song Chang, about 4 miles south-eastward of Quang Yen, by approaching through Lach Huyen (page 317).

Song Gia enters the western side of Song Bach Dang about 1¼ miles north-westward of the entrance to Song Chang. Île des Deux Song, which is hilly and intersected by creeks, lies on the western side of Song Bach Dang, northward of Song Gia. Nui U Bo, a hill at the eastern end of Île des Deux Song, lies about three-quarters of a mile north-north-eastward of the northern entrance point of Song Gia. A hilly islet, on which is Nui Leo, lies close off the western bank of the river about 8½ cables north-westward of Nui U Bo.

Gang Dong Bai, a creek, enters the eastern side of the river, about

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Chart 3875.

one mile north-north-eastward of Nui U Bo. On the northern side of Gang Dong Bai are numerous islands and creeks.

Northward of the entrance to Gang Dong Bai, Song Bach Dang is known as Song Da Bach. Port Redon is situated on the north-eastern bank of Song Da Bach, on the south-western side of one of the above-mentioned islands, about $1\frac{3}{4}$ miles northward of Nui U Bo.

Anchorage.—There is anchorage abreast the western entrance of Song Chang, in a depth of $3\frac{3}{4}$ fathoms (6^m9), muddy sand.

Port Redon.—Lights.—Light-buoys.—Port Redon is connected by railway to the mines of Uong Bi, a town, about 3 miles north-north-eastward. There is a jetty at Port Redon a short distance north-westward of the end of the railway, but vessels cannot go alongside it.

Leading lights are situated at Port Redon. The front light is exhibited, at an elevation of 21 feet (6^m4), from a white pyramidal structure, about 34 feet (10^m4) in height, surmounted by a triangle, painted with black and white bands, about 2 cables southward of the end of the railway. The rear light is exhibited, at an elevation of 34 feet (10^m4), from a house and pylon, surmounted by a triangle, painted with white and black bands, and about 43 feet (13^m1) in height, about $2\frac{3}{4}$ cables northward of the front light.

These lights in line, bearing 355°, lead towards Port Redon from a position off the entrance to Song Chang.

Two conical light-buoys, each exhibiting a *red fixed* light, mark the south-western side of the channel leading to Port Redon, about $1\frac{3}{4}$ cables south-westward and $2\frac{1}{2}$ cables north-westward, respectively, of the front leading light. In 1946, the lights on these buoys were extinguished.

Coal, cement materials and chrome ore are exported from Port Redon (*Lat. 20° 59′ N., Long. 106° 46′ E.*); vessels load from lighters when secured to mooring buoys off the port. There is communication by sampan with Quang Yen, where a steamer to Haïphong is available.

Lach Huyen.—Light.—Lach Huyen is the north-easternmost mouth of Rivière Thaï Binh (page 304). It is entered between a point situated about 3 miles east-north-eastward of the eastern entrance point of Cua Nam Trieu (page 311), and the south-western end of the swamp extending from the western side of Île de la Cac Ba, about $1\frac{1}{4}$ miles south-eastward. A tower stands on the western entrance point.

The islands and dangers on the north-eastern side of the approach to Lach Huyen are described on pages 307-309.

The bar is situated from 3 to $4\frac{1}{2}$ miles south-eastward of the entrance, and patches of mud, which dry, extend from the western entrance point as far as the bar. In 1950, it was reported that there were fishing stakes east-north-eastward of the bank, which dries, extending south-eastward from Île de Ha Nam.

Sandbanks, which dry from half a foot to 2 feet (0^m2 to 0^m6), lie near and on the bar, but depths of 5 feet (1^m5) are obtainable westward of Morne D (page 309). A shoal patch, with a depth of 8 feet (2^m4) over it, lies outside the bar, about 2 miles south-south-westward of Morne D.

Vessels drawing 16 feet (4^m9) with local knowledge can cross the bar at high water springs and proceed in deep water to the eastern

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Chart 3875.

entrance of Song Chang, situated on the western side of Lach Huyen, about 2 miles within the entrance.

In Song Chang there are depths of not less than 16 feet (4m9) to within a distance of about 2½ miles below Quang Yen (page 316), but between this position and the town there are depths of only about 3 feet (0m9) and the river is obstructed in places by sunken rocks and drying patches. For the anchorage situated 4 miles south-eastward of Quang Yen, *see* page 316.

Pointe des Pirates (page 309) lies about 1¾ miles northward of the western entrance point of Lach Huyen. Between Pointe des Pirates and Île de la Mangue, about one mile north-north-westward, is the southern entrance of a channel leading to Baie d'Halong. This channel is described on page 330.

A mudbank, which dries, extends about three-quarters of a mile southward from Île de la Mangue.

A light is exhibited, at an elevation of 30 feet (9m1), from a red hut and platform on piles, about 46 feet (14m0) in height, about one mile southward of Île de la Mangue (*Lat. 20° 51′ N., Long. 106° 53′ E.*).

Directions.—The channel across the bar of Lach Huyen is narrow and open to the sea ; the marks are distant and often indistinct. No vessel should cross without local knowledge.

Charts 1965, 2062, 2661a, 1263.

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CHAPTER VII

ARCHIPEL DES FAÏ TSI LONG

Charts 3875, 3876, 3877.

ARCHIPEL DES FAÏ TSI LONG.—North-eastward of Île de la Cac Ba (page 308), for a distance of about 40 miles, the north-western shore of the Tongking gulf is bordered by numerous high, rocky islands and islets of limestone formation, known as the Archipel des Faï Tsi Long or Griffes du Dragon. These islands present most varied forms with very distinct summits, some of which attain an elevation of about 1,000 feet (304m8).

Approaching this part of the coast from southward, Îles Norway (page 307) make a good landfall; the fort on the southern end of Île de la Cac Ba (*Lat. 20° 43′ N., Long. 107° 03′ E.*) and Laï Tao, an island with a conical summit, about 23 miles eastward, are easily identified.

Most of the archipelago consists of steep rocks and islets of marble, from 150 to 300 feet (45m7 to 91m4) high, some of which have been worn away at the water line and overhang the sea. From a distance, these islands appear to form a compact mass but, on a nearer approach, sheltered channels between the islets can be distinguished, leading to open spaces in which there are secure anchorages.

North-westward of the archipelago the coast is bordered in places by steep mountain ranges running parallel with the coast, which only give rise to mountain streams, and as the out-going tidal stream from the delta, south-westward, sets southward, no mud is deposited in the channels of the archipelago, and the water in them is deep and almost clear.

The tidal streams reveal some of the irregularities in the depths by characteristic eddies.

Chart 3875.

The anchorages in the archipelago are the only ones available for large vessels along the coast of Tonkin. The principal channels leading to these anchorages are :—

Entrée Profonde, which leads from Baie de Lan Ha (page 320) through Rade du Crapaud to Baie d'Halong.

Passe Henriette, which leads into Baie d'Halong, where there is good and secure anchorage, in depths of from 5 to 8 fathoms (9m1 to 14m6), northward of Île de la Surprise (page 324).

Passe du Casque and Passe de la Mouche, which lead into Chenal de la Saône and Grande Baie des Faï Tsi Long, where there are depths

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Chart 3875.

of from 7 to 12 fathoms (12m8 to 21m9). Both these channels are approached over a bank, about 4 miles wide, over which the depths are from 4 to 5 fathoms (7m3 to 9m1).

All these channels lead to sheltered anchorages where the working of cargo is never interrupted and where vessels can even go alongside one another as if in port. The holding ground is good and tidal streams attain a rate of only one knot at spring tides. These anchorages afford fair shelter during typhoons as they are practically landlocked and the islets are high enough to diminish sensibly the violence of the wind.

Pak Ha Mun (page 367), in which the depths are from 6 to 7 fathoms (11m0 to 12m8), also affords secure anchorage in a depth of 8 fathoms (14m6).

During the North-east monsoon there is considerable swell in Grande Baie des Faï Tsi Long, but in the other anchorages it is scarcely felt.

Caution.—Vessels should not pass close to the limestone rocks as large pieces occasionally break off; the small islets should also be given a wide berth, in order to avoid any shoal heads in their vicinity which may have escaped detection during the course of the survey.

Tides and tidal streams.—The height of the tide can be estimated roughly by the appearance of the uncovered portions of the islets in the archipelago. At low water there is a line of green coral and sponges. Oysters are seen on the rocks at heights of from 4 to 9 feet (1m2 to 2m7) above low water. At a height of from 9 to 13 feet (2m7 to 4m0) above low water the rocks are yellowish, and above this they are blackish.

There are two main channels through which the tidal wave passes. Passe Henriette and Entrée Profonde carry that part which flows into Baie d'Halong and Grande Baie des Faï Tsi Long, and Passe de la Mouche and Passe du Casque carry the part which flows into the archipelago between Grande Baie des Faï Tsi Long and Île de Ké-Bao (chart 3876).

The rate of the tidal stream and the rise and fall of the tide are somewhat increased in the narrow channels near Île de Ké-Bao. However, the tidal streams do not run at a great rate, except at springs and in the narrow passages.

Climate and weather.—*See* page 36. The heat in summer is greater among the islands than in the delta south-westward of them or to seaward; the thermometer, at this season, sometimes registers 100°. The lowest temperature during the winter is from 46° to 50°.

From December to March fogs are frequent and persistent.

Pilots.—Pilots are available and reside at Hongay, on the eastern side of the entrance to Port Courbet. Vessels requiring a pilot should make a request by radio to the station at Apowan, in Cac Ba (page 310), stating the estimated time of arrival at the entrance to Passe Henriette. A pilot will then be sent to the lookout station of Le Dragon (*Lat. 20° 50′ N., Long. 107° 08′ E.*), in Passe Henriette (page 325), and when the vessel is sighted will meet her off L'Orange.

PORT COURBET AND APPROACHES.—Baie de Lan Ha.—Baie de Lan Ha is entered between the southern extremity of Île de la Cac Ba (page 308), and Pointe Edma, the south-western extremity

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Chart 3875.

of Île de la Paix, about 5 miles east-north-eastward. On the western side of the bay are some inlets, in the approach to which are numerous islets, where secure anchorage can be found. The eastern side of the bay, high, steep, and almost continuous, is formed by Île de la Paix, with several islets lying close off its north-western side, and Île de l'Union, which lies about 1½ cables farther northward. At its northern end Baie de Lan Ha leads into Entrée Profonde, the entrance to which is not visible, when approaching from southward until past Île du Milieu.

Islets and dangers.—The islets and dangers which lie in the south-western approach to Baie de Lan Ha are described on pages 308-309. North-eastward of these, several islets and dangers lie off the south-eastern side of Île de la Cac Ba; the south-easternmost of these is Roche du Pêcheur, with a depth of 27 feet (8m2) over it, situated about 2 miles east-south-eastward of the southern extremity of Île de la Cac Ba. Îlots N, a group of two islets, with Îlots M, a group of three islets, about 3½ cables north-eastward, lie about 1½ miles east-south-eastward of the same point.

Rocher Soulipaï, which dries 10 feet (3m0), lies 8½ cables north-eastward of Îlots M. A rock, with a depth of 3 feet (0m9) over it, lies about 1½ cables southward of Rocher Soulipaï. La Madone, an islet, 228 feet (69m5) high, lies about half a mile north-north-westward of Îlots M. An islet, 166 feet (50m6) high, and La Semelle, an islet, lie about one cable southward and about 2¾ cables south-westward, respectively, of the south-eastern extremity of La Madone.

Between La Madone (*Lat. 20° 43′ N., Long. 107° 04′ E.*) and the southern end of a peninsula projecting from the south-eastern side of Île de la Cac Ba, about 1¼ miles northward, there is a chain of islands, separated from Île de la Cac Ba by a narrow and shallow channel. L'Ecaille, an islet, 149 feet (45m4) high, is the south-easternmost of this chain and lies about 3½ cables north-eastward of La Madone. A rock, which dries one foot (0m3), lies about one cable north-westward of L'Ecaille.

Mouillage de l'Ancre lies between the last-mentioned chain of islets and a group of islands lying about 4 cables eastward. Nam Bui, an islet, 231 feet (70m4) high, is the southernmost of this group, and lies about 3½ cables east-north-eastward of L'Ecaille.

Roche Forban, which dries 2 feet (0m6), lies near the middle of the southern entrance of Mouillage de l'Ancre, about 2 cables west-south-westward of the northern extremity of Nam Bui. Sommet Parseval, in line with Rocher Nain, bearing 353°, leads eastward of Roche Forban.

Îlot Cornu, 120 feet (36m6) high, lies about half a mile north-eastward of Nam Bui.

Île des Plages, 257 feet (78m3) high, lies close northward of Nam Bui, and is attached to it by a reef; an islet lies about 1½ cables eastward of Île des Plages. Île du Détroit, 248 feet (75m6) high, the northernmost of this group, lies about one cable north-eastward of Île des Plages. Îlot S, 120 feet (36m6) high, lies about one cable south-eastward of Île du Détroit.

The north-eastern end of Mouillage de l'Ancre is entered between Île du Détroit and Île Bambou, about 2 cables north-north-westward. This entrance is obstructed by a rock, which dries 3 feet (0m9), lying

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Chart 3875.

close off the north-western end of Île du Détroit. Just within the entrance, and close westward of the western extremity of the same islet, there is an islet.

Rocher Nain lies at the northern end of the anchorage, about one cable south-westward of Île Bambou.

Île Bambou, 317 feet (96m6) high, lies close off the eastern side of the peninsula, mentioned on page 321, which projects from the south-eastern side of Île de la Cac Ba. Between this peninsula and Pointe O, the south-eastern extremity of another peninsula, about 2½ miles north-eastward, there is a bay, the shores of which are indented and in which are numerous islands, the positions of which can best be seen on the chart. Baie du Parseval, a narrow inlet, which extends about 2¼ miles north-westward, is situated in the northern part of this bay. Sommet Parseval, 779 feet (237m4) high, lies on the south-western side of the inlet, about 2 miles west-north-westward of Pointe O.

Île en Dentelle, 418 feet (127m4) high near its north-western end, lies about 4 cables northward of Île Bambou. An islet, 195 feet (59m4) high, the eastern extremity of which is Pointe de l'Accident, lies close south-eastward of Île en Dentelle, to which it is connected by a reef.

Pointe Rose, the south-eastern extremity of an island, close off which is an above-water rock, lies about three-quarters of a mile northward of Pointe de l'Accident. A rock, with a depth of 7 feet (2m1) over it, lies about 4 cables south-westward of Pointe Rose and 1¼ cables off the north-eastern side of Île en Dentelle.

Île du Coude lies about 6½ cables north-eastward of Pointe Rose.

Île du Milieu (*Lat. 20° 46′ N., Long. 107° 06′ E.*), 198 feet (60m4) high, the easternmost of the islands fronting the entrance of Baie du Parseval, lies about 3½ cables south-eastward of Pointe O.

In the approach to Baie de Lan Ha, from south-eastward, the southernmost danger is La Mauvaise, a rock with a depth of 10 feet (3m0) over it, which lies on the western side of the approach to Passe Henriette, nearly 2 miles east-south-eastward of Pointe Edma.

On the eastern side of Baie de Lan Ha, Île Sainte, the westernmost island, lying close off the north-western side of Île de la Paix, is situated about one mile northward of Pointe Edma. A 33-foot (10m1) patch lies about 1¼ cables westward of the south-western point of the island.

Passe des Hydres, less than 2 cables wide, which separates Île de la Paix from Île de l'Union, is obstructed by rocks, the westernmost of which, with a depth of 17 feet (5m2) over it, lies about a half cable south-south-westward of the southern extremity of Île de l'Union.

Anchorages.—Small vessels with local knowledge will find good shelter in Mouillage de l'Ancre, in a depth of 23 feet (7m0). Entering this anchorage from southward Roche Forban should be avoided, as directed on page 321.

Baie du Parseval affords excellent shelter in case of a typhoon to small vessels with local knowledge, in depths of from 3 to 4 fathoms (5m5 to 7m3), west-north-westward of its narrow entrance.

Entrée Profonde.—Dangers.—Entrée Profonde is entered from southward between the southern extremity of Île de l'Union and Pointe O. On its eastern side, several islets and dangers lie close

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Chart 3875.

off the south-western side of Île de l'Union, which attains an elevation of 717 feet (218m5) in La Selle, situated about 6½ cables northward of the southern extremity and a short distance inland.

Îlot de la Recherche, 113 feet (34m4) high, with a rock close off its south-western side, lies about 3 cables north-westward of the southern extremity of Île de l'Union and about 1½ cables offshore.

Above-water rocks, close westward of which is a rock with a depth of one fathom (1m8) over it, extend about 2 cables offshore, abreast La Selle. Îlot Rouillée, 185 feet (56m4) high, lies about one cable northward of these rocks, one cable offshore. A rock, which dries 2 feet (0m6), lies close northward of Îlot Rouillée.

A chain of islets and dangers lie off the northern part of the west coast of Île de l'Union. The southernmost islet, 215 feet (65m5) high, lies about 6 cables northward of Îlot Rouillée and about one cable offshore. Close northward of this islet is Le Sphinx, 248 feet (75m6) high. A group of rocks, 113 feet (34m4) high, lie about one cable northward of Le Sphinx, and nearly in the middle of Entrée Profonde. Two islets, 185 and 195 feet (56m4 and 59m4) high, lie about 2 cables north-north-eastward and 3¾ cables northward, respectively, of the group of rocks 113 feet (34m4) high. Les Gardes, a group of rocks, 149 feet (45m4) high, and rocks which dry, lie about 1¾ cables south-westward of the north-western extremity of Île de l'Union. Les Jumeaux are two islets, 116 and 133 feet (35m4 and 40m5) high, lying about one cable westward of the north-western extremity of Île de l'Union.

On the western side of Entrée Profonde there is an indentation between Pointe O and a point about three-quarters of a mile north-north-eastward. Port Bayard is situated at the head of this indentation, in the approach to which are several islands. An islet, 218 feet (66m4) high, lies close southward of the northern entrance point of this indentation and a spit, with depths of less than 5 fathoms (9m1) over it, extends one cable southward from the islet. Northward of this islet, for a distance of about one mile, the eastern side of Île de la Cac Ba is steep-to.

Entrée Profonde leads into Rade du Crapaud at its northern end, between the north-western extremity of Île de l'Union and Le Cobra (*Lat. 20° 49′ N., Long. 107° 05′ E.*), an island, about half a mile north-westward; the latter is separated from the north-eastern side of Île de la Cac Ba by a narrow channel, in the south-eastern entrance of which there is a rock, 110 feet (33m5) high.

Anse de la Croix lies at the northern end of Île de l'Union; in its entrance are two islets, the southern of which is 103 feet (31m4) high.

Anchorage.—Port Bayard affords excellent shelter in case of a typhoon to small vessels with local knowledge, in depths of from 3 to 4 fathoms (5m5 to 7m3), but the entrance is narrow, the width between the rocks on either side being only about 80 yards (73m2).

Rade du Crapaud.—Islets and dangers.—Rade du Crapaud affords the most accessible shelter for large vessels from typhoons when in the neighbourhood of Îles Norway.

Le Crapaud, an islet, 38 feet (11m6) high, lies on the south-western side of the roadstead, about one cable north-eastward of the northern end of Le Cobra. Chenal de l'Etoile is entered from eastward between Le Crapaud and La Limace, an islet, 103 feet (31m4) high, 3¼ cables

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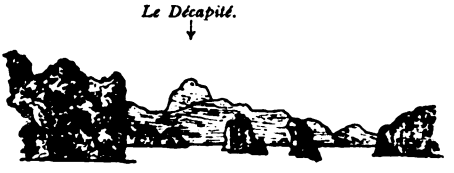
Chart 3875.

north-westward and about 3 cables off the north-eastern side of Île de la Cac Ba. A gravel patch, with a depth of 28 feet (8m5) over it, lies about 1½ cables north-eastward of the northern end of La Limace.

Chenal du Volta is entered from south-eastward between La Limace and the south-eastern extremity of Île de la Surprise, three-quarters of a mile north-eastward. Several islets, the highest of which has an elevation of 241 feet (73m5), lie within 2 cables of the south-western side of Île de la Surprise. Le Décapité, a prominent peak, 490 feet (149m4) high, is situated on Île de la Surprise about half a mile northward of its south-eastern extremity, and the summit of the island, 615 feet (187m5) high, lies about 4 cables westward of Le Décapité.



Entrée Profonde from abreast the entrance to Port Bayard.
(*Original dated* 1886.)

On the eastern side of Rade du Crapaud, Passe Crochet is entered between Le Promontoire, an islet, 356 feet (108m5) high, which lies about 4 cables northward of the north-western extremity of Île de l'Union, and Le Limaçon, an islet, 51 feet (15m5) high, about half a mile northward. A shoal, with a depth of 5 fathoms (9m1) over it, lies within 2½ cables westward of the northern end of Le Promontoire. Le Limaçon (*Lat. 20° 50′ N., Long. 107° 07′ E.*) is the south-eastern-most islet lying off the south-eastern end of Île de la Surprise ; a bank, with depths of less than 5 fathoms (9m1) over it, extends 4½ cables southward from Le Limaçon and 5½ cables eastward, forming the northern side of Passe Crochet.

Anchorage.—Directions.—Vessels can anchor in Rade du Crapaud with Le Crapaud bearing 150°, distant 6½ cables, in a depth of 7 fathoms (12m8), mud. In making this anchorage the gravel patch, north-eastward of La Limace, previously mentioned, should be avoided.

Vessels can proceed to Rade du Crapaud either by Entrée Profonde or by Passe Henriette (page 325) and Passe Crochet (page 325).

Channels north-eastward of Île de la Cac Ba.—Numerous islands lie off the north-eastern side of Île de la Cac Ba, between which are several channels, the recommended tracks through which are indicated on the chart by pecked lines.

The south-eastern end of Chenal de l'Etoile (page 323) runs between the north-eastern side of Île de la Cac Ba and Île de l'Etoile, 566 feet (172m5) high, which lies about half a mile off it and three-quarters of a mile north-westward of La Limace. Westward of Île de l'Etoile the channel runs north-westward and joins Route de Quang Yen (page 330), through Chenal de la Cathédral. Another channel branches off Chenal de l'Etoile and runs along the north-eastern and northern sides of Île de la Cac Ba, joining Route de Quang Yen near the north-western extremity of that island.

Charts 1965, 2062, 2661a, 1263.

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Chenal du Volta, the shortest passage to the Route de Quang Yen, runs between Île de l'Etoile and Île de la Surprise. Baie de la Manche is situated on the south-western side of the latter island with Le Trou de l'Obus, a remarkable inlet, close westward of its western entrance point. Chenal du Volta turns northward into Baie d'Halong off the south-western end of Île de la Surprise, and, from the same position, another channel runs west-north-westward towards the northern end of Île de la Cac Ba. This channel crosses Chenal de la Cathédral and, about one mile farther west-north-westward, divides into two branches, the southern one joining the channel which runs along the northern side of Île de la Cac Ba, and the northern one, Chenal de l'Alouette, running north-westward between the islets lying off the northern end of the same island.

Passe Crochet runs close northward of Le Promontoire (page 324), and Îles des Grottes, 366 feet (111m6) high, about 3 cables eastward, and enters Passe Henriette between Le Nez, an islet 221 feet (67m4) high, which lies 6½ cables east-north-eastward of Île des Grottes and La Bouillotte, an islet, about 4½ cables west-north-westward of Le Nez. Two islets lie a short distance westward of La Bouillotte, the southern of which is named Le Haricot.

Passe de l'Arche, leading to Baie d'Halong, is entered between the last-mentioned islets and Le Limaçon. The track recommended from Passe Crochet to Passe de l'Arche leads over the bank which extends eastward from Le Limaçon ; on the eastern end of this bank there is a depth of 3¼ fathoms (5m9). The track then trends north-north-westward between the islets lying close off the eastern side of Île de la Surprise and a group of islands which lie about a quarter of a mile farther eastward. Passe de l'Arche leads into Baie d'Halong between l'Arche, an islet, about one cable eastward of the northern end of Île de la Surprise and Le Goëland, an islet, 290 feet (88m4) high, about 4 cables farther eastward. Two islets, the outer of which is Le Revolver, lie within 1½ cables north-westward of the western extremity of Le Goëland.

Le Décapité (page 324) is a useful mark by which to distinguish Passe de l'Arche.

Passe Henriette.—Islets and dangers.—Buoy.—Light.—Passe Henriette is the best channel of approach to Baie d'Halong and Port Courbet, and the only one that should be used by vessels of deep draught ; its entrance lies between Île Henriette, 192 feet (58m5) high, about 1½ miles eastward of Pointe Edma (page 322), and L'Orange (*Lat. 20° 44′ N., Long. 107° 10′ E.*), an islet, 133 feet (40m5) high, about one mile farther eastward, on the south-eastern point of which there is a white mark which, in 1946, was reported to be visible, rather indistinctly, for a distance of about 5 miles from southward.

On the western side of the approach, Île Henriette is the south-easternmost of several islets lying close together off the south-eastern end of Île de la Paix. Two dangers, La Mauvaise (page 322), and a rock, with a depth of 3 feet (0m9) over it, lie about 6 and 2 cables, respectively, southward of Île Henriette. L'Orange, in line with l'Escabeau (page 338), bearing 073°, leads between these dangers.

Le Bloc, an islet, 310 feet (94m5) high, lies about 1½ cables northward of Île Henriette and La Licorne, an island, 343 feet (104m5) high near its southern end, lies 4½ cables north-north-westward of Le Bloc.

Charts 1965, 2062, 2661a, 1263.

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Several islets lie eastward of La Licorne ; Le Bouddha, 91 feet (27m7) high, the south-easternmost, lies about half a mile north-eastward of the southern extremity of the island, and Le Canot, 72 feet (21m9) high, the north-easternmost, lies about 6 cables east-north-eastward of its northern extremity. About midway between Le Canot and the northern end of La Licorne are three islets, named Les Trois Frères.

La Hache, 235 feet (71m6) high, about half a mile northward of La Licorne, is the outermost of the islets lying off the northern end of Île de la Paix.

Le Youyou, a rock, 28 feet (8m5) high, lies about 7 cables eastward of La Hache and close westward of the track leading through Passe Henriette. A spit, with a depth of 4½ fathoms (8m2) at its outer end, extends over half a cable north-eastward from Le Youyou. Two rocky patches, with depths of 7 and 19 feet (2m1 and 5m8) over them, lie about 1¾ and 3¾ cables, respectively, north-westward of Le Youyou.

On the eastern side of Passe Henriette are several islets and dangers.

A 6-fathom (11m0) rocky patch lies one cable south-south-eastward of L'Orange. L'Epieu, an islet, 146 feet (44m5) high, lies 8 cables east-north-eastward of L'Orange. A shoal, with a depth of 26 feet (7m9) over it, lies about 2½ cables south-eastward of L'Epieu. For L'Escabeau, an islet about 1½ cables north-eastward of L'Epieu, *see* page 338. La Sentinelle, an islet, lies 3¾ cables northward of L'Epieu, with two rocks, the northern of which is Le Tabouret, 28 feet (8m5) high, and Le Caillou du Centre, the southern, between them.

Le Fantôme, an islet, 149 feet (45m4) high, lies about three-quarters of a mile northward of L'Orange, and La Jonque, an islet, 202 feet (61m6) high, lies about a quarter of a mile northward of La Fantôme. A spit, at the outer end of which is a depth of one fathom (1m8), extends 1½ cables north-north-westward from La Jonque.

A rock, with a depth of 4 feet (1m2) over it, lies 2 cables west-south-westward of La Jonque (*Lat. 20° 45′ N., Long. 107° 10′ E.*), and another rock, with a depth of 2 feet (0m6) over it, lies about 4 cables westward of the same islet, and is marked on its western side by a red conical buoy surmounted by a cone, but it was reported, in 1947, to be missing. Les Lapins are two rocks above water lying about 4½ cables east-north-eastward of La Jonque. Le Donjon, an islet, 254 feet (77m4) high, lies 3½ cables north-north-eastward of Les Lapins. La Tente, 64 feet (19m5) high, lies about one cable westward of Le Donjon. Le Bouquet, 107 feet (32m6) high, lies about one mile west-north-westward of La Tente.

Île du Cirque, 428 feet (130m5) high, lies about 6 cables east-north-eastward of Le Bouquet and at the southern end of an extensive bank, with depths of less than 5 fathoms (9m1) over it, which separates Passe Henriette from Passe de l'Aspic (page 338). Le Musoir, 405 feet (123m4) high, the south-westernmost of these islands, is situated about half a mile westward of Île du Cirque, and is separated from the spit extending north-eastward from Le Youyou (*see* above) by deep water. Between Île du Cirque and Le Musoir are the islets of La Rotonde and Le Bison, the latter being 284 feet (86m6) high. A shoal, with a depth of 2½ fathoms (4m6) over it, lies about half a mile north-north-westward of Le Musoir, and depths of less than 5 fathoms (9m1) extend a quarter of a mile farther north-westward. La Corbeille, 55 feet (16m8) high, and Le Panier, 46 feet (14m0) high, are

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Chart 3875.

islets lying about 2¼ cables northward and 3½ cables north-north-eastward, respectively, of Le Musoir.

On the western side of Passe Henriette, Le Marteau, an island, lies about 6½ cables north-north-westward of La Hache and close off the eastern side of Île de l'Union. Île Creuse lies about one mile north-north-westward of Le Marteau, and about 3 cables off the north-eastern end of Île de l'Union. A rock, which dries 11 feet (3m4), lies about 1¼ cables northward of Île Creuse with two islets between it and the north-eastern end of Île de l'Union.

La Scie, an island, 303 feet (92m4) high, lies about half a mile north-westward of Île Creuse. Le Nez (page 325) lies nearly half a mile north-eastward of La Scie with deep water between.

A reef, with a depth of 2 fathoms (3m7) over it, extends half a cable eastward from Le Nez ; the outer end of this reef is close westward of the recommended track, which leads through the pass.

On the eastern side of Passe Henriette, a chain of islands extends from L'Oiseau, situated about 8½ cables northward of Le Musoir, for about 3½ miles northward. Near the northern end of the chain are Île du Dédale and Le Grand Sommet, an island, 691 feet (210m6) high.

On the eastern side of the recommended track leading to Baie d'Halong is a small group of islands, of which L'Echelle 412 feet (125m6) high is the southernmost and Le Dragon the northernmost, on which there is a prominent casemate, lying about 4 cables north-eastward of Le Nez. A bank, over which there is a depth of less than 5 fathoms (9m1), extends about 3 cables south-south-eastward from L'Echelle. Chenal du Ducouëdic (page 336), which leads to Grande Baie des Faï Tsi Long, passes eastward of this bank.

Le Salacco (*Lat. 20° 50′ N., Long. 107° 07′ E.*), an island, 527 feet (160m6) high, lies on the western side of Passe Henriette about 6 cables west-north-westward of Le Dragon ; it is the southernmost of a group of islands which divides Passe Henriette from Passe de l'Arche. Le Moine, the north-easternmost islet of this group, lies 4½ cables north-north-eastward of the northern extremity of Le Salacco, with an islet, 142 feet (43m3) high, nearly midway between. This islet is the easternmost of a group, named Les Elfes, extending 6½ cables west-north-westward between Le Salacco and Le Goëland. A rock, 6 feet (1m8) high, lies close off the eastern end of Le Moine, and a spit, over the outer end of which is a depth of less than 5 fathoms (9m1), extends 3 cables south-eastward from the islet and nearly as far as the recommended track through the pass.

La Noisette, an islet, 116 feet (35m4) high, lies 5½ cables northward of Le Dragon, and Le Puceron, an islet, 33 feet (10m1) high, lies about three-quarters of a mile north-north-westward of La Noisette. La Roche Percée, an island, 415 feet (126m5) high, with an islet close southward of its western end, lies 3¾ cables northward of Le Puceron. A bank, with depths of less than 3 fathoms (5m5) over it, extends three-quarters of a mile south-south-eastward from the eastern end of La Roche Percée, and with depths of less than 5 fathoms (9m1) as far as Le Dragon.

An islet lies close north-north-eastward of the eastern extremity of La Roche Percée, and two islets lie within a quarter of a mile of the middle of the northern side.

La Tribune, 195 feet (59m4) high, is the southernmost of a small

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Chart 3875.

group of islands lying 3½ cables north-westward of La Roche Percée. A spit, with depths of less than 5 fathoms (9m1) over it, extends about 3 cables south-south-eastward from La Tribune.

Chenal de l'Hamelin (page 330) is entered from southward between La Tribune and Le Bonnet phrygien, an islet, 352 feet (107m3) high, on the east, and L'Index, an islet, 513 feet (156m4) high, on the west. There is a prominent notch about half way up the steep western side of L'Index, and a white mark on the eastern side. A bank, with depths of less than 5 fathoms (9m1) over it, extends about 4 cables southward from L'Index.

A light is exhibited, at an elevation of 46 feet (14m0), from a pyramid structure, on the north-eastern side of Île de l'Index.

Passe Henriette turns north-westward and leads into Baie d'Halong, between Le Moine and L'Index, the track passing about a quarter of a mile northward of Le Goëland and 1½ cables northward of La Noix, an islet lying about 3 cables northward of Île de la Surprise (page 324).

Several islets lie within half a mile north-westward of L'Index, the largest of which is Le Boomerang. La Banane, 333 feet (101m5) high, lies about one mile north-north-westward of L'Index.

For anchorages, *see* page 329.

Tidal streams.—At high water there is a northerly set, with a rate of from a quarter to half a knot, in Passe Henriette, gradually turning westward and south-westward and slackening. About 3 hours after high water, the tidal stream sets southward, in the direction of the pass, attaining a maximum rate of from one to 1¼ knots, seven hours after the high water. The northerly flow on the rising tide is fastest about 4 hours before high water.

Directions.—To enter Passe Henriette, a vessel from south-eastward should give Norway Est a good berth, and bring its eastern extremity astern, bearing 163°, which will lead to the middle of the fairway between Île Henriette (*Lat. 20° 44′ N., Long. 107° 09′ E.*) and L'Orange. (*See* view facing this page.) She should then keep the summit of La Banane in line with the notch on the western side of L'Index, bearing 338°, which leads to L'Index, clear of all dangers, but a berth of one cable should be given to the spit, extending north-eastward from Le Youyou and, while passing Le Nez, the vessel should haul eastward of the leading line in order to avoid the reef which extends south-eastward from that islet. In clear weather a distant summit will be seen on the leading line. *See* view facing this page.

A vessel from south-westward may pass between the dangers southward of Île Henriette by keeping L'Escabeau in line with L'Orange, bearing 073°, until she is nearing the alignment for Passe Henriette, when she should follow the directions for a vessel approaching from south-eastward.

Baie d'Halong.—Islets and dangers.—Buoys.—Baie d'Halong lies north-eastward of Île de la Cac Ba and at the north-western end of Archipel des Faï Tsi Long. It is mostly occupied by a shallow bank, but southward of this bank large vessels can anchor off the inner entrances of the various channels which lead into the bay on that side.

At the south-western end of the bay there is a channel leading between islands to Quang Yen, and on its eastern side Chenal de l'Hamelin leads between a number of islets to Port Courbet, situated

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Île Henriette. *Île du Cirque.* *La Jonque.* *L'Orange.* *L'Epieu.*

Entrance to Passe Henriette from 4 miles southward of Île Henriette.

Le Nez. *L'Index.* *Bonnet phrygien.* *L'Echelle.*

View on leading line of Passe Henriette close eastward of Le Youyou.

(a)

La Toque.
La Toque in line with the eastern extremity of Le Rhinoceros, bearing 001°.

(b)

Pain de Sucre. *La Toque.* *Îlot Frangé.*
La Toque between Îlot Frangé and Le Pain de Sucre, bearing 141°.

(c)

Southern extremity of Île du Chenal open of southern extremity of Île du Repos, bearing 287°.

Three views of leading marks in Chenal de l'Hamelin.

(*Originals dated* 1886.)

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To face page 320.

L'Escargot.

L'Escargot, bearing 010°, *between the islands on either side of the pass.*

Passe de l'Aspic.

Île de l'Entrée. *Île du Parseval.* *La Mouche.* *Île des Deux Passes.* *Île Haute.*

La Mouche in line with eastern extremity of Île des Deux Passes, bearing 015°.

Passe du Casque.

Île du Marsouin. *Le Casque, bearing* 313°.

Passe du Casque.

(*Originals dated* 1886.)

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on the northern side of the bay. For about one mile southward of the entrance to Port Courbet there is deep water.

The south-western side of the bay is occupied by the islets lying off Île de la Cac Ba. Île de l'Hôpital lies half a mile westward of La Noix (page 328). Two islets, the northern of which is 149 feet (45m4) high, lie close northward of the western extremity of Île de l'Hôpital. Two red and black conical buoys are moored about one mile and 1½ miles, respectively, northward of Île de l'Hôpital.

Île de la Chèvre, 556 feet (169m5) high, lies between the northern entrances of Chenal du Volta and Chenal de la Cathédral, about 1½ miles west-north-westward of Île de l'Hôpital. La Selle, an island, 582 feet (177m4) high, lies about one mile west-north-westward of Île de la Chèvre. Les Marionettes, a group of rocks, one of which is 44 feet (13m4) high, lies about 6½ cables north-westward of the northern extremity of La Selle.

Île des Merveilles, 615 feet (187m5) high, the northernmost of the islands lying off Île de la Cac Ba, lies about 1¼ miles north-westward of La Selle. Île des Merveilles is connected with Île de la Chèvre by the south-western part of the shoal which occupies most of Baie d'Halong.

A rock, which dries, and with depths of 1¼ fathoms (2m3) close off its south-western side, lies near the middle of Baie d'Halong, about 1½ miles north-north-eastward of Île de la Chèvre. This shoal is marked, on its south-western side, by a buoy painted black and red, and surmounted by a sphere.

The north-eastern side of Baie d'Halong is occupied by numerous islands, of which, Le Boomerang and La Banane have been described on page 328; others are described with Chenal de l'Hamelin on page 330.

In the north-western part of Baie d'Halong, Île aux Cerfs, 271 feet (82m6) high, lies about 1¾ miles north-westward of Île des Merveilles, and about one mile off the coast to which it is connected by a bank which dries. A wooded islet lies 1¾ miles east-north-eastward of Île aux Cerfs and about 4 cables offshore.

Anchorages.—In Baie d'Halong vessels can anchor anywhere between L'Index and Les Marionettes (*Lat. 20° 53′ N., Long. 107° 01′ E.*).

The most frequented anchorage is between Île de la Surprise and L'Index, in depths of from 6 to 8 fathoms (11m0 to 14m6), mud. At this anchorage it is cooler than farther westward.

Vessels can anchor abreast Île de l'Hôpital, in depths of from 5 to 8 fathoms (9m1 to 14m6).

The holding ground is excellent, but vessels making a long stay should weigh their anchors occasionally to prevent them being buried.

Weighing anchor during the ebb stream, large vessels should be careful not to approach too closely the edge of the extensive bank which limits the northern side of the anchorages.

Boats can cross the bay to Hongay from these anchorages by passing between the rock, which dries, in the middle of the bay, and La Palourde, an islet, 5 feet (1m5) high, which lies about 1½ miles north-eastward. To ensure passing westward of La Palourde, the houses, and at night the lights of the town, of Hongay, should be kept open westward of the islands at the western entrance of Chenal de l'Hamelin.

Baie d'Halong to Haïphong.—Beacons.—From the western end

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Chart 3875.

of Baie d'Halong there is a channel, available for vessels with local knowledge, which leads through Route de Quang to the anchorage situated 4 miles south-eastward of Quang Yen (*see* page 316), or to Haïphong through Lach Huyen and Cua Nam Trieu.

The channel recommended is not indicated on the chart and runs through Grande Brêche, a channel about one cable wide, which separates the islands lying south-westward of Île des Merveilles from Île de la Brêche, situated about 6 cables south-westward of the latter, and Petite Brêche, a narrow channel between two islets which lie about 2 miles westward of the northern end of Île de la Brêche. La Corne is a prominent peak at the northern end of the largest island on the south-western side of Petite Brêche.

From the western end of Petite Brêche the channel passes north-westward of Les Deux Frères, about one mile south-westward of Petite Brêche, and eastward of Îlot A, 126 feet (38m4) high, about 7 cables south-south-westward of Les Deux Frères. Thence the channel runs along the north-western side of Île de la Cac Ba, with mudbanks, covered with mangroves, on either side, and enters Lach Huyen between Pointe des Pirates and the light-structure southward of Île de la Mangue (page 318); this part of the channel is marked on its south-eastern side by three red and black beacons surmounted by cones, the positions of which can best be seen on the chart.

In the channel recommended there was, in 1941, a least depth of from 2 to 3 feet (0m6 to 0m9) and vessels drawing from 8 to 9 feet (2m4 to 2m7) could then use it at half-tide.

Chenal de l'Hamelin. — Dangers. — Buoyage. — Lights. — Chenal de l'Hamelin is the deepest channel leading to Port Courbet, having a least depth of 12 feet (3m7) in the reach between La Toque (*Lat. 20° 55′ N., Long. 107° 08′ E.*) and La Lionne (page 331). The channel, after passing eastward of L'Index (page 328), trends north-eastward and passes about 1¼ cables south-eastward of La Tourelle, an islet situated about 8 cables north-eastward of L'Index.

A rock, with a depth of 2 feet (0m6) over it, lies 2¾ cables south-westward of La Tourelle.

La Clochette lies on the south-eastern side of the channel, about 6 cables eastward of La Tourelle. In 1946, white marks were reported on the southern side of La Tourelle and the northern side of La Clochette.

A light is exhibited, at an elevation of 10 feet (3m0), from a pyramid structure, on La Clochette.

From a position about one cable north-westward of La Clochette, Chenal de l'Hamelin trends northward, passing eastward of La Casemate, an islet, 3¼ cables north-westward of La Clochette, and westward of Îlot Frangè, 169 feet (51m5) high, situated 8 cables northward of La Clochette.

A rock, which dries 4 feet (1m2), lies close south-westward of the southern end of La Casemate.

Chenal du Château Renaud (page 345), leading to Grande Baie des Faï Tsi Long, is entered from south-westward between La Clochette and La Casemate.

North-north-westward of Îlot Frangè, Chenal de l'Hamelin passes close westward of La Toque, an islet, 80 feet (24m4) high, lying 4¼ cables north-north-westward of Îlot Frangè, and north-eastward of

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Le Porte-Fanal, an islet, 84 feet (25m6) high, situated about 4 cables farther north-westward; in 1946, a white mark was reported on the summit of this islet.

A light is exhibited, at an elevation of 86 feet (26m2), on Porte-Fanal.

The shoalest part of the channel is midway between Le Porte-Fanal and La Lionne, an islet, 212 feet (64m6) high, about 4½ cables northward; here it turns west-north-westward, passing southward of Le Dogue, an islet, about a quarter of a mile westward of La Lionne, and southward of Île du Campement about 5½ cables farther west-north-westward, towards the southern extremity of Île du Repos, 474 feet (144m5) high, which lies about 1¼ miles west-north-westward of La Lionne.

A light is exhibited, at an elevation of 26 feet (7m9), from a pyramid structure, on Île du Repos.

A rock, which dries 2 feet (0m6), lies about one cable south-eastward of the south-eastern extremity of Île du Campement.

On the southern side of the channel are Le Pilote and L'Encrier islets, which lie about one and 1½ miles, respectively, west-north-westward of Le Porte-Fanal.

The channel leads southward of Le Cône, an islet lying about 6 cables westward of Île du Repos, on the southern extremity of which a white mark was reported in 1946, and southward of Île du Chenal, 431 feet (131m4) high, situated about 1¾ cables farther westward; this latter island lies about half a mile southward of a steep hill, 651 feet (198m4) high, which lies close south-westward of the town of Hongay. Île des Chaloupes, 520 feet (158m5) high, with Île du Repère, 395 feet (120m4) high, close south-westward, lies about half a cable northward of Île du Chenal. La Tiare, an islet, lies on the southern side of Chenal de l'Hamelin, about 3 cables south-south-eastward of Île du Chenal.

Dredged channel.—Buoys.—At the north-western end of Chenal de l'Hamelin, southward of Île du Repos (*Lat. 20° 56′ N., Long. 107° 06′ E.*), and Île du Chenal, there is a bar through which there is a narrow dredged channel, with a depth, in July 1946, of 12 feet (3m7), soft mud; the channel could then be used at half-tide by vessels drawing 19 feet (5m8) and, at high water, by vessels drawing 26 feet (7m9). This channel is marked on its southern side by three black conical buoys, the westernmost of which is surmounted by a cylinder and occasionally exhibits a *red fixed* light, but in 1946 it was reported to be extinguished.

Tidal streams.—In Chenal de l'Hamelin between La Lionne and La Sirène, 6 cables south-westward, the in-going flow on the rising tide reaches about half a knot at half-tide; it ceases from 2 to 3 hours before high tide.

Westward of Le Nid (page 345) the flow on the falling tide sets west-south-westward and attains a rate of nearly one knot at half-tide. On the rising tide the flow sets north-north-westward and is fastest about 4 hours before high water; its rate is then less than one knot.

Directions.—From a position about one cable north-westward of La Clochette, a vessel should steer with La Toque in line with the eastern extremity of Le Rhinoceros, about 1¼ miles northward, bearing 001°, and pass close south-westward of La Toque. (*See* view (a) facing page 328.) After passing La Toque the vessel should steer with the

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Chart 3875.

north-eastern extremity of that islet, astern, in line with the summit of Le Pain de Sucre, about 6 cables south-eastward, bearing 139°, which leads close north-eastward of Le Porte-Fanal. (*See* view (b) facing page 328.) The view shows La Toque midway between Le Pain de Sucre and Îlot Frangè, bearing 141°. When about midway between Le Porte-Fanal and La Lionne, the vessel should steer with the southern extremity of Île du Chenal, bearing 287°, open southward of the southern extremity of Île du Repos, until abreast Île du Campement. (*See* view (c) facing page 328.)

After passing the southern extremity of Île du Repos, the vessel should steer with a whitewash mark on the southern extremity of Le Cône, bearing 302°, towards the eastern end of the dredged channel.

Le Cône.

Whitewash mark on the southern extremity of Le Cône, bearing 302°.

(*Original dated* 1886.)

Passing through the dredged channel the vessel should keep about 50 yards (45m7) northward of the buoys, with a white mark, situated a short distance northward of the southern extremity of Île du Repos, in line with the south-western extremity of that island, astern, bearing 102°, which will lead to the greater depths southward of the entrance to Port Courbet.

Port Courbet.—Dangers.—Buoys.—Beacon.—Cua Luc, the entrance to Port Courbet, a bay situated at the northern end of Baie d'Halong, is about 2 cables wide. Hongay, an important town, stands on the eastern side of the approach and Va Chai (*Lat. 20° 58′ N., Long. 107° 02′ E.*), a village, stands on the coast about a quarter of a mile south-westward of the western entrance point. Île au Charbon, with two islets lying close off its western side, and another islet close off its south-eastern side, lies about one mile north-north-eastward of the entrance. A drying mudbank extends about 2½ cables southward from Île au Charbon, and two rocks, one, which dries 4 feet, (1m2), and the other, with a depth of less than 6 feet (1m8) over it, lie about one cable south-south-westward and 1¾ cables south-westward, respectively, of the south-western extremity of the island.

On the south-eastern side of Port Courbet, Île Bayard lies half a mile north-eastward of the eastern entrance point and close offshore. Sommet Jaune, 156 feet (47m5) high and prominent, lies on Pointe Edmond, the northern entrance point of Rivière Fuchs, about 1¾ miles farther north-eastward. Rivière des Mines, which is only practicable for boats for a distance of about one mile from its mouth, flows into the bay about three-quarters of a mile southward of Sommet Jaune. A bank, which dries from 2 to 5 feet (0m6 to 1m5), extends half a mile from the south-eastern side of the port, and a rock, which dries 5 feet (1m5), lies about 1½ cables westward of the northern extremity of Île Bayard.

The south-western side of the port is fringed by a bank, which dries from 2 to 4 feet (0m6 to 1m2), extending about 2 cables offshore; an islet lies on this bank about one cable offshore and 2½ cables north-westward of the western entrance point of the port, and another islet lies close offshore about 6 cables farther north-westward.

A rock, which dries 6 feet (1m8), situated 8 cables north-westward of

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Chart 3875.

the western entrance point and 3 cables offshore, is marked by a beacon, painted in white and black bands.

Sommet Buisson, 254 feet (77m4) high, and prominent, is the summit of an island, situated about 1½ miles north-westward of the western entrance point of the port.

There are two mooring buoys a short distance within the entrance.

A black conical buoy, surmounted by a cylinder, is moored about half a mile westward of the northern end of Île Bayard.

Northward of Île au Charbon the bay is shallow and mostly dries.

Tidal streams.—In Cua Luc the north-going tidal stream begins 4 hours after low water during small tides, and 2 hours after low water during large tides. The south-going tidal stream begins one hour after high water.

The south-going tidal stream is the stronger, and attains a rate of as much as 3 knots after heavy rains; the north-going stream has a maximum rate of about three-quarters of a knot at half-tide. Outside the entrance the tidal stream is stronger on the eastern side than on the western side and during the out-going tidal stream there is an eddy which sets north-eastward off Va Chai.

In the anchorage the southerly flow begins about one hour after high water, with both small and large tides.

A tide-gauge is situated near the eastern entrance point.

Pilots.—Pilots reside at Hongay.

Anchorages.—Vessels with local knowledge can anchor anywhere in the deep water southward of the entrance, provided they do not incommode vessels approaching or leaving the wharves at Hongay.

In the southern part of this anchorage, when the tidal stream is against the wind, the sea is rough for boats.

Small vessels are recommended to anchor off Va Chai (*Lat. 20° 58′ N., Long. 107° 03′ E.*), in depths of from 4½ to 2 fathoms (8m2 to 3m7) where the tidal streams are weak and where it is cooler in summer.

Prohibited anchorage.—A submarine cable crosses the entrance between Hongay and Va Chai; about 25 yards (22m9) on either side of the landing places of the cable is a white notice board, with a red border, inscribed in blue letters "Câbles télégraphiques PTT". Vessels are forbidden to anchor in the vicinity of the cable. *See* page 25.

Hongay.—Port facilities.—There are three wharves, with depths, in 1946, of from 17 to 23 feet (5m2 to 7m0) alongside, equipped with seven cranes of from 8 to 12 tons lifting capacity.

There is a 60-ton floating sheers.

A small quantity of coal can be obtained. Water is scarce. Repairs can be effected. Tugs and lighters can be obtained. There are two hospitals.

Communication.—Hongay is connected to the general telegraph system, and by rail to the mines at Cam Pha (page 362).

There is frequent communication by steamer with Haïphong and Mon-Cay (page 385).

Storm signals. — Storm signals are shown at Hongay. *See* page 18.

GRANDE BAIE DES FAÏ TSI LONG AND APPROACHES.—Dangers.—Grande Baie des Faï Tsi Long is the largest in the archi-

Charts 1965, 2062, 2661a, 1263.

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pelago, but on account of its distance from the delta of the Song Ca, is not of so much importance as Baie d'Halong; it is more of a thoroughfare to the channels within the islands. The bay is exposed to north-easterly winds which cause a sea somewhat dangerous for boats.

The most prominent islands within the bay are Île du Milieu, which lies by itself on the south-eastern side of the bay, 7 miles east-north-eastward of La Clochette (page 330); Île du Chenal, about 1½ miles north-eastward of Île du Milieu; La Voile, a steep rock, 80 feet (24m4) high, slightly leaning southwards, on the north-western side of the bay, about 4½ miles westward of Île du Chenal; and L'Aigle, about 2¼ miles north-eastward of Île du Chenal. Seen from westward, L'Aigle dominates all other islands and rocks.

The bay is entered from south-westward by Chenal du Ducouëdic, which branches off from Passe Henriette. Chenal du Château Renaud, which branches off Chenal de l'Hamelin, close northward of La Clochette, enters the western end of the bay, runs along its north-western side, and joins Chenal de la Saône eastward of L'Aigle.

From southward, Grande Baie des Faï Tsi Long is entered by Passe de l'Aspic, Passe du Casque, which is joined by Passe du Lapérouse near its southern end, and by Passe de la Mouche.

Chenal de la Saône (page 343), which runs along the southern and south-eastern sides of the bay, leads into other channels between the islands at its eastern end.

A bank, with depths of less than 3 fathoms (5m5) over it, extends about 7½ miles south-westward across Grande Baie des Faï Tsi Long from a position, about a quarter of a mile westward of the northern extremity of L'Aigle. Two patches, each with a depth of 5 feet (1m5) over it, lie on this bank about one mile west-north-westward of Île du Chenal.

Charts 3875, 1965.

Southern approach.—Dangers.—Îles Norway, which lie nearly in the middle of the southern approach to Grande Baie des Faï Tsi Long, are described on page 307, and the islets and dangers which lie on the south-western approach between Îles Norway and Île de la Cac Ba, are described on page 308.

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Laï Tao (*Lat. 20° 44′ N., Long. 107° 27′ E.*), 559 feet (170m4) high, is the southernmost of the islands lying on the north-eastern side of the southern approach, and is situated about 15 miles east-north-eastward of Norway Est. The island is steep-to on its southern side outside the fringing reef. The north-western side is fringed by a bank, with depths of less than 3 fathoms (5m5) over it, and on which there are some rocks above water, extending about 1½ cables offshore. A rocky spit, with a depth of 11 feet (3m4) at its outer end, extends about 3 cables northward from the northern extremity of the island.

A 22-foot (6m7) patch lies about 7 cables west-south-westward of the northern extremity. A detached shoal, with depths of from 10 to 18 feet (3m0 to 5m5) over it, lies with its southern extremity about 8 cables northward of the south-western end of the island. Two shoals, with depths of 18 and 14 feet (5m5 and 4m3) over them, lie about 1¾ miles westward and 8½ cables west-north-westward, respectively, of the northern extremity of the island.

Charts 2062, 2661a, 1263.

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Chart 3875.

Roche du Chinois, with a depth of 15 feet (4m6) over it, lies 9 cables south-westward of Laï Tao.

Tché li paï, a rock, 28 feet (8m5) high, surrounded by a reef, lies nearly 6 miles west-south-westward of Laï Tao. At low water several pointed rocks are visible, which occasionally resemble the masts of junks. Foul ground extends about 2½ cables north-north-westward from the rock, and a 3-fathom (5m5) rocky patch lies 4½ cables northward.

Récif des Salpes, which dries 1½ feet (3m4), lies about 1¼ miles northward of Tché li paï. A reef, which dries one foot (0m3), lies about 5 cables north-north-eastward, and a rocky shoal, with a depth of 11 feet (3m4) over it, lies about one mile north-north-westward of Récif des Salpes.

Charts 3875, 1965.

Siong Laï Tao, 428 feet (130m4) high, lies about one mile north-north-eastward of Laï Tao; it is fringed by a reef on its eastern and south-eastern sides. Hon Mau, 28 feet (8m5) high, lies about 8½ cables westward of the southern extremity of Siong Laï Tao.

Chart 1965.

An islet, 290 feet (88m4) high, lies close off the north-eastern end of Siong Laï Tao, and is connected to it by a reef. A reef, which dries 11 feet (3m4), lies about one cable northward of the islet, and a ridge, with depths of less than 3 fathoms (5m5) over it, extends 3 cables farther northward.

Chart 3875.

A rock, which dries 7 feet (2m1), lies about 8 cables northward of the same islet. Kao Pui Tao, 57 feet (17m4) high, lies about 1¾ miles northward of Siong Laï Tao; a reef extends about 2 cables west-north-westward from its northern extremity.

Cap Quan Lan (*Lat. 20° 49′ N., Long. 107° 28′ E.*), the southern extremity of Île de Quan Lan, lies about 8 cables north-westward of Kao Pui Tao.

Tima Tao, an island, 294 feet (89m6) high, lies about 3¼ miles west-north-westward of Laï Tao. A rock, which dries 7 feet (2m1), lies close off the middle of the western side of the island, and a bank, with depths of less than 3 fathoms (5m5) over it, extends about 1¾ miles westward. Baou Tao, 303 feet (92m3) high, lies on the southern side of this bank, half a mile from the southern end of Tima Tao. Depths of less than 6 feet (1m8) extend about 3 cables northward from Baou Tao, and also between it and Tima Tao.

Fong Wong, an island, 769 feet (234m4) high, lies about one mile north-north-eastward of Tima Tao; its north-eastern side is connected to Cap Quan Lan by a bank, with depths of from 3 to 4 fathoms (5m5 to 7m3) over it. Fong Wong is rocky, wooded and inhabited.

Mao Lin Tao, 159 feet (48m5) high, lies about 6 cables off the eastern side of Fong Wong, with depths of about 3 fathoms (5m5) between. A reef, with a depth of 15 feet (4m6) at its outer end, extends about a quarter of a mile north-north-westward from the islet, and a spit, near the outer end of which is a rock, which dries 5 feet (1m5), extends about the same distance south-eastward from the islet.

In the area comprised between Tima Tao and Fong Wong, on the western side, and the islands which lie southward of Cap Quan Lan, on the eastern side, the depths are irregular.

Charts 2062, 2661a, 1263.

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Chart 3875.

Ile Danh Do-La, 782 feet (238m4) high, and inhabited, lies with its south-eastern extremity about 8 cables westward of the northern part of Fong Wong. From south-westward the green hills of Île Danh Do-La contrast conspicuously with the black marble rocks which lie about half a mile off its western side.

Hon Na, 123 feet (37m5) high, lies about 3 cables south-south-eastward of the south-eastern extremity of the island. A rock, 3 feet (0m9) high, and rocks, which dry from 2 to 4 feet (0m6 to 1m2), lie about 3 cables south-westward of the same point. Between Hon Na and Tima Tao the depths are irregular, the least depth being 8 feet (2m4), situated about one mile southward of Hon Na.

Île du Sud, with Le Fourmilier, 179 feet (54m6) high, close northward of it, is the southernmost of a group of islets which lie from about 3 cables to one mile southward of the south-western extremity of Île Danh Do-La. Le Bonnet d'âne, 12 feet (3m7) high, lies close off the south-eastern side of Île du Sud. Le Loir, 77 feet (23m5) high, lies about half a mile southward, and La Musaraigne, 77 feet (23m5) high, and La Fouine, 162 feet (49m4) high, lie about 3½ and 7 cables, respectively, south-south-westward of the same point.

A bank, with depths of less than 5 fathoms (9m1) over it, extends about 5 miles south-westward from Île Danh Do-La, and north-westward as far as the eastern side of Passe de l'Aspic (page 338), across the entrances of Passe de la Mouche and Passe du Casque ; also south-eastward to within a short distance of Laï Tao.

Tidal streams.—Near Laï Tao the tidal streams set north-eastward and south-westward at a rate of from one to 1½ knots. *See* also page 367.

Anchorage.—During the North-east monsoon there is good anchorage for small vessels with local knowledge 2 cables northward of Tima Tao, in a depth of about 8 fathoms (14m6), mud. During the South-west monsoon this anchorage is not good.

In order to reach this anchorage from eastward, vessels can pass between Cap Quan Lan and Kao Pui Tao ; from westward, they can either pass northward of Tima Tao (*Lat. 20° 45' N., Long. 107° 23' E.*) or between the latter and Laï Tao.

Chenal du Ducouëdic.—Dangers.—Chenal du Ducouëdic is the deepest channel from Passe Henriette to Grande Baie des Faï Tsi Long. It branches from Passe Henriette, about one mile south-eastward of Île Creuse (page 327), and trends northward, passing eastward of the bank which extends south-south-eastward from L'Echelle ; thence between La Noisette and Le Sac, an islet lying about half a mile eastward. Le Grand Sommet, close south-eastward of Le Sac, is described on page 327.

Le Sampan, a rock which dries 11 feet (3m4), lies on the south-eastern side of the channel about 3½ cables northward of Le Sac ; La Noisette, bearing about 230° and open south-eastward of the south-eastern extremity of Le Salacco, leads north-westward of Le Sampan.

In this part of the channel Îlot A, about 2 miles north-north-eastward of Le Sac, should be kept bearing about 027°, and nearly midway between La Pastille, an islet lying about one mile north-north-eastward of Le Sac, and Ile Commune, 395 feet (120m4) high, about 2 cables east-north-eastward of La Pastille.

Passe du Vaïco and Chenal du Brandon, which lead across the

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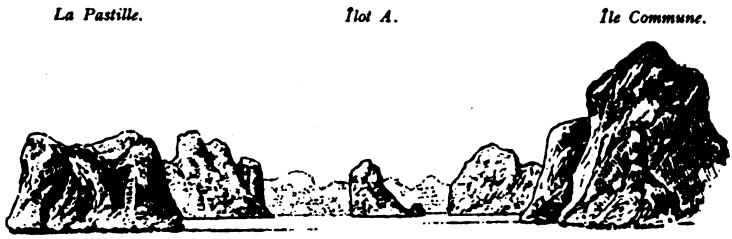
extensive shoal area northward of Île du Cirque (page 326), and which connect Passe de l'Aspic with Chenal du Ducouëdic, join the latter together between Île Commune and La Borne (*Lat. 20° 51′ N., Long. 107° 10′ E.*), an islet, about 6 cables southward. The two former channels are only available to shallow draught vessels with local knowledge. A sunken rock, almost awash, lies about one cable north-north-westward of La Borne.



Îlot A, bearing about 027°.
(*Original dated* 1886.)

La Dague, an islet, lies on the north-western side of Chenal du Ducouëdic, about 6 cables northward of Le Sac. After passing between La Pastille and Île Commune, the channel lies eastward of Les Pléïades, a group of islets lying about 3½ cables north-westward of Île Commune. In this part of the channel the south-eastern extremity of La Pastille is in line with a hill on the north-western side of Le Sac, bearing about 198°.

The south-eastern extremity of La Pastille in line with a hill on the north-western side of Le Sac, bearing about 198°.
(*Original dated* 1886.)

From a position about 6 cables northward of Île Commune, the channel trends more north-eastward, with La Voile (page 334), in line with the north-western extremity of Le Képi, an islet, 133 feet (40^{m}5) high, lying about 1½ miles south-westward of La Voile, bearing 027°.

La Voile in line with the north-western extremity of Le Képi, bearing 037°.
(*Original dated* 1886.)

The channel then passes north-westward of Îlot A, and close north-westward of an islet lying about 2 cables farther north-north-eastward; some sunken rocks lie close off the north-western side of this

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islet. Île de l'Entrée, 264 feet (80m5) high, lies on the same side of the channel, about half a mile north-eastward of the last-mentioned islet; a rock, which dries 6 feet (1m8), lies on the south-eastern side of the channel 3 cables south-westward of Île de l'Entrée. Le Képi, bearing about 037°, opens north-westward of L'Enclume, a rock, 24 feet (7m3) high, about 4 cables north-eastward of Île de l'Entrée, leads close north-westward of this rock. There is a 2½-fathom (4m6) patch in the fairway close westward of l'Enclume.

On the north-western side of the channel, Le Tapir, an islet, lies about 3¼ cables westward of Îlot A, and Le Rempart, an islet, lies about half a mile north-eastward of Le Tapir, with two islets between.

Chenal du Ducouëdic enters Grande Baie des Faï Tsi Long between Île de l'Entrée and an islet about a quarter of a mile west-north-westward. It then turns east-north-eastward, passes southward of L'Enclume (*Lat. 20° 54′ N., Long. 107° 10′ E.*), and joins Chenal de la Saône about 1¾ cables northward of Le Plumet Vert, an islet, 97 feet (29m6) high, situated about 6½ cables eastward of Île de l'Entrée. A shoal, with a depth of 1¼ fathoms (2m3) over it, lies midway between Le Plumet Vert and Le Képi.

Passe de l'Aspic.—Dangers.—Passe de l'Aspic lies eastward of Passe Henriette (page 325). There is a least depth of 27 feet (8m2) on the recommended track in the pass.

Approaching from south-westward, a vessel should pass eastward of L'Épieu (page 326), and L'Escabeau, an islet, 172 feet (52m4) high, about 1½ cables north-north-eastward, at a distance of at least one mile. The entrance lies north-north-eastward of L'Escabeau, with that islet bearing 210°, astern, showing about midway between Fausse Quille (page 307) and the north-westernmost island of the group lying about one mile westward of Grande Norway.

L'Escabeau.

L'Escabeau, bearing 210°, and about midway between Fausse Quille and the group of islands lying westward of Îles Norway.

(*Original dated* 1886.)

On the north-western side of the entrance to Passe de l'Aspic are La Sentinelle and Le Donjon, both of which are described on page 326. L'Oreiller, 248 feet (75m6) high, and L'Îlot Pointu, 172 feet (52m4) high, lie about 8½ cables and one mile, respectively, north-north-eastward of Le Donjon. L'Eléphant, 254 feet (77m4) high, lies one mile north-north-eastward of L'Îlot Pointu. A rocky shoal, with a depth of 16 feet (4m9) over it, lies about 1¾ cables eastward, and a similar shoal, with a depth of 8 feet (2m4) over it, lies 4½ cables north-north-westward of the northern extremity of L'Eléphant.

Passe du Pluvier, which leads north-westward towards Passe du Vaïco and Chenal du Brandon, branches north-north-westward from Passe de l'Aspic about 1¼ miles east-south-eastward of L'Eléphant.

La Mère, an islet, 146 feet (44m5) high, with L'Enfant, a rock, 61 feet (18m6) high, close south-eastward, lies on the south-eastern side of the entrance of Passe de l'Aspic, about 2½ miles eastward of L'Eléphant. A rock, which dries 6 feet (1m8), lies half a cable north-

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Chart 3875.

westward of La Mère. L'Arche, an islet, lies about 6 cables north-westward of La Mère; there is a depth of 1½ fathoms (2m7) close south-westward of L'Arche. Two islets lie 2¾ and 5¾ cables, respectively, northward of La Mère.

From a position about 3 cables north-westward of L'Arche, L'Escargot, an islet, 218 feet (66m5) high, situated 4½ miles farther north-north-eastward, will be seen between the islets bordering Passe de l'Aspic on either side, bearing about 010°. *See* view facing page 329.

Le Roquet, an islet, lies on the eastern side of the pass about 6 cables north-north-eastward of L'Arche. Île de l'Aspic lies on the western side of the pass 5½ cables north-westward of Le Roquet; it is the south-easternmost of a group of islands which separates Passe du Pluvier from Chenal du Brandon. A bank, with depths of less than 3 fathoms (5m5) over it, extends about 2¼ cables from the northern side of Île de l'Aspic. La Cafetière, an islet, 166 feet (50m6) high, lies 6½ cables west-south-westward of Île de l'Aspic. Île de l'Hyène, about 1¼ miles north-westward of Île de l'Aspic, is the largest island of the group mentioned above.

L'Escalier (*Lat. 20° 50′ N., Long. 107° 14′ E.*), an islet, lies on the western side of Passe de l'Aspic, 8 cables north-north-eastward of Île de l'Aspic. A rocky ledge, with a depth of one fathom (1m8) at its extremity, extends 1¼ cables southward from L'Escalier, and a bank, with a depth of 11 feet (3m4) over it, extends nearly half a cable eastward.

Île du Souffleur lies on the eastern side of the pass, about 4 cables eastward of L'Escalier. A patch, with a depth of 8 feet (2m4) over it, lies close northward of Île du Souffleur on the southern end of a ridge which connects this islet with the western end of Île de l'Arène, about 6 cables northward; some rocks above water lie on the same ridge, about one cable off the latter island. A rock, with a depth of less than 6 feet (1m8) over it, lies close off the western extremity of Île de l'Arène.

Chenal du Brandon, which leads westward towards Chenal du Ducouëdic, branches off Passe de l'Aspic between L'Escalier and La Tranche, a rock, about one mile northward, lying on the western side of Passe de l'Aspic.

On the eastern side of the pass, Île du Pont lies about 8 cables northward of Île de l'Arène; between these are some islets, the positions of which can best be seen on the chart. A bank, with a depth of 3 feet (0m9) over it, extends a short distance from the south-western side, and a spit, with a depth of 2 fathoms (3m7) over it, extends a short distance from the northern end of Île du Pont.

On the western side of the pass, La Potîche, a rock close off the eastern end of an islet, lies about one cable westward of Île du Pont. An islet lies about half a cable north-eastward of La Potîche.

After passing between the last-mentioned islet and Île du Pont, Passe de l'Aspic runs about half a mile in a north-easterly direction and then turns north-north-eastward and passes between some islets, the positions of which can best be seen on the chart; it enters Grande Baie des Faï Tsï Long between L'Escargot (*see* above) and Le Nègre, a rock, about 6 cables eastward, and joins Chenal de la Saône about one mile farther north-north-eastward. Shoals, over which the

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Chart 3875.

depths are from 19 to 23 feet (5m8 to 7m0), lie eastward of L'Escargot and about 3½ cables south-westward of Le Nègre, but there is a narrow channel between them in which the depths are greater.

Tidal streams.—The tidal streams are very strong abreast Île du Pont.

Passe du Casque and approach.—Dangers.—Passe du Casque lies eastward of Passe de l'Aspic and is approached from southward between L'Epieu (page 326) and Tché le pai (page 335). The best line of approach is with Fausse Quille (page 307), astern, bearing 227°. On the north-western side of the approach, an islet lies about 1¼ miles east-north-eastward of La Mère (page 338), and Le Turco, a rock, lies about 4 cables farther north-eastward. Numerous islands and rocks lie northward of Le Turco, the positions of which can best be seen on the chart.

Passe du Casque is entered between Le Chien and Île de l'Entrée, about one mile westward. As the entrance is approached the green hills of Île Danh Do-La contrast with the black rocks of marble lying off it. The least depth in the approach, on the line recommended, is 26 feet (7m9), and on nearing the entrance the depths become greater. Vessels with local knowledge, that can enter, can make use of the pass at any state of the tide.

Passe du Lapérouse (page 342) lies eastward of these islands, and is entered eastward of Le Turco.

On the eastern side of the approach to Passe du Casque, Recif des Salpes and Le Fourmilier have been described on pages 335 and 336 respectively. Île Double (*Lat. 20° 49′ N., Long. 107° 20′ E.*) lies about 1¼ miles northward of Le Fourmilier and 4 cables from the western side of Île Danh Do-La. L'Oeil and Le Pic, two islets less than one cable apart, lie about 1½ cables northward of Île Double, and Le Cône, an islet, lies about 1¾ cables farther northward. Îlot Gris lies 2¼ cables north-eastward of Île Double. Le Chien, an islet, with Île Ronde, about one cable north-westward, lies about one mile northward of Île Double.

A rock, with a depth of one foot (0m3) over it, lies just outside the entrance to Passe du Casque, about three-quarters of a mile eastward of the southern extremity of Île de l'Entrée. The eastern extremity of Île des Deux Passes, situated 8½ cables north-north-eastward of Île de l'Entrée, in line with La Mouche, a low rock, 2 cables farther north-north-eastward, bearing 015°, leads westward of this rock and through the entrance of the pass. (*See* view facing page 329.) If La Mouche cannot be distinguished, the rock will be avoided by passing about 3 cables eastward of Île de l'Entrée.

A rock, which dries less than one foot (0m3), lies about one cable eastward of the northern end of Île de l'Entrée, and a bank with a depth of 23 feet (7m0) over it, extends 3 cables northward from the same island; an islet lies on the western side of this bank. Two rocks, the eastern of which dries 9 feet (2m7) and the western 3 feet (0m9), lie close together on the western side of the pass, about 4 cables northward of Île de l'Entrée.

On the eastern side of the pass, Île Haute lies 8 cables east-north-eastward of Île de l'Entrée. Several islets and rocks lie eastward and north-north-eastward of Île Haute, the positions of which can best be seen on the chart.

Charts 1965, 2062, 2661a, 1263.

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Chart 3875.

The western side of Île Danh Do-La is hilly ; there is a hill, 366 feet (111m6) high, close to its south-western extremity, and Nui Tuta, 336 feet (102m4) high, lies 6 cables south-south-eastward of its north-western extremity.

Passe de la Mouche (page 342) is entered from southward between Île des Deux Passes and an islet, lying about 2¾ cables east-south-eastward. La Boule, a rock above water, lies about one cable southward of this islet, with other rocks between them.

From a position about 3 cables southward of Île des Deux Passes, Passe du Casque assumes a north-westerly direction, with Le Casque, an islet, 855 feet (260m6) high, about 2¾ miles north-westward of Île des Deux Passes, bearing 313°. *See* view facing page 329.

Île Verte lies on the south-western side of this part of the pass, about 6 cables north-north-westward of Île de l'Entrée. A rock, with a depth of 26 feet (7m9) over it, lies 2 cables north-eastward of Île Verte. L'Encrier, a rock, lies about a quarter of a mile north-westward of Île Verte. A rock, which dries one foot (0m3), lies about one cable eastward of L'Encrier. Some islets and rocks lie south-westward of Île Verte and L'Encrier, the positions of which can best be seen on the chart.

Passe du Lapérouse joins the south-western side of Passe du Casque between L'Encrier and an islet about 4 cables westward, which is connected with another islet, 3½ cables north-westward, by a ridge, over which there is a depth of one fathom (1m8).

Île du Marsouin (*Lat. 20° 52′ N., Long. 107° 17′ E.*) lies on the south-western side of Passe du Casque about 8 cables north-westward of L'Encrier. A bank, with depths of from 8 to 18 feet (2m4 to 5m5) over it, extends about 1¼ cables south-eastward from the eastern side of Île du Marsouin. La Méduse, the coast of which is much indented, is the largest of a group of islands and rocks lying close south-westward of Île du Marsouin.

On the north-eastern side of Passe du Casque, several islets lie north-westward of Île des Deux Passes, the positions of which can best be seen on the chart. A rock, with a depth of 39 feet (11m9) over it, lies on the north-eastern side of the fairway nearly 3 cables northward of Île du Marsouin.

Passe du Casque enters Grande Baie des Faï Tsi Long between Le Casque and an islet about a quarter of a mile eastward, and joins Chenal de la Saône about 1½ miles northward of Le Casque. A bank, with a depth of 25 feet (7m6) over it, extends about 1½ cables south-eastward from the south-eastern extremity of Le Casque ; a rock, with a depth of one fathom (1m8) over it, lies one cable northward of the western extremity of the island, and depths of less than 6 fathoms (11m0) extend about 2 cables farther northward. A shoal, with a depth of 32 feet (9m8) over it, lies close south-westward of the recommended track, about three-quarters of a mile north-north-westward of the western extremity of the island.

A ridge, with a depth of 11 feet (3m4) over it, extends about 4 cables north-north-westward from the islet situated about a quarter of a mile eastward of the southern end of Le Casque ; a rock, 77 feet (23m5) high, with an islet about one cable eastward of it, lies near the northern extremity of this ridge.

From a position about a quarter of a mile north-westward of

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Chart 3875.

L'Encrier, the south-western extremity of Île Double, astern, bearing about 146°, and just open south-westward of Île Verte, leads through the north-western portion of the pass.

Passe du Lapérouse.—From its southern entrance, the recommended track from a position about a quarter of a mile eastward of Le Turco (page 340), Passe du Lapérouse leads north-north-eastward; on its north-eastern side, about 1½ miles north-eastward of Le Turco, is Le Cancrelat, an islet, and the islets lying southward of L'Encrier. On the north-western side are La Méduse and the islets lying southward and south-westward of it. There is a least depth of 28 feet (8m5) on the recommended track indicated on the chart at the southern end, but the depths increase as Passe du Casque is approached.

Approaching the pass from southward, La Mère, L'Enfant (page 338) and Le Cancrelat are easy to identify.

Two islets lie on the north-western side of Passe du Lapérouse about 2 cables northward of a rock, above water, about half a cable eastward of La Méduse.

Tidal streams.—At the junction of Passe du Lapérouse and Passe du Casque the flow reaches a rate of 1½ knots with a tidal range of about 10 feet (3m0).

Passe de la Mouche.—Dangers.—Passe de la Mouche should only be used by vessels with local knowledge. The southern entrance is described on page 340.

On the eastern side of the pass, a rock, 14 feet (4m3) high, lies 3½ cables northward of the northern extremity of Île Danh Do-La (*Lat. 20° 52′ N., Long. 107° 21′ E.*). Between this rock and Île Danh Do-La is the entrance to a channel leading into Baie de Quan Lan (page 366); this channel passes round the southern and eastern sides of Île Dao Trao and enters the southern side of Chenal du Lutin (page 348). A rock, 12 feet (3m7) high, lies on the northern side of this channel, 7 cables eastward of the 14-foot (4m3) rock.

Île Dao Trao lies about 6½ cables northward of Île Danh Do-La. A peninsula projects from the north-western end of Île Dao Trao, on the northern end of which is Nui Say Tau, 362 feet (110m3) high.

La Mouche, on the western side of Passe de la Mouche, has been mentioned on page 340. A shoal, with a depth of 15 feet (4m6) over it, lies about 2¾ cables west-south-westward of La Mouche. Le Parseval, an islet, lies about one mile northward of Île des Deux Passes. About 2¾ cables farther northward is the south-eastern extremity of Île des Bîches, which is fringed by a reef extending a short distance offshore. Île Kieu, the south-eastern extremity of which is fringed by a reef, lies close north-eastward of Île des Bîches. The south-eastern extremities of these two islands are joined by a ridge, over which there are depths of from one to 2 feet (0m3 to 0m6).

A beacon is charted on the south-eastern end of Île Kieu, but, in 1933, was reported not to be visible. A rock, which dries one foot (0m3), lies about half a mile northward of the south-eastern extremity of Île Kieu, close offshore. The north-eastern side of Île Kieu is fringed by a narrow drying reef. Le Fourchu, a hill, lies at the northern end of the island.

Charts 3875, 3876.

On the eastern side of the pass, a chain of islets extends about one mile north-north-westward from the north-western end of Île Dao

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Charts 3875, 3876.

Trao. A 4-fathom (7m3) patch lies 2½ cables west-north-westward of the north-western extremity of Île Dao Trao. A 19-foot (5m8) patch lies nearly in mid-channel about half a mile north-westward of the same point, and a 5-fathom (9m1) patch lies on the eastern side of the fairway about 4 cables farther north-north-westward, and about one cable from the south-western side of the northernmost of the chain of islands.

Îlot Vert, with a shallow bank extending a short distance from its south-western side, lies on the eastern side of the channel, half a mile eastward of the northern end of Île Kieu. Two rocks, with depths of 5 and 6 feet (1m5 and 1m8) over them, lie about 2 and 3½ cables, respectively, north-westward of Îlot Vert.

Northward of the northern extremity of Île Kieu, Passe de la Mouche turns north-westward and enters Chenal de la Saône, between an island lying close north-westward of the northern end of Île Dieu and the western extremity of Van Duoi (*Lat. 20° 55′ N., Long. 107° 20′ E.*), an island, about a quarter of a mile north-eastward. A bank, with depths of less than 6 fathoms (11m0) over it, extends about 5½ cables westward from the north-western end of Van Duoi.

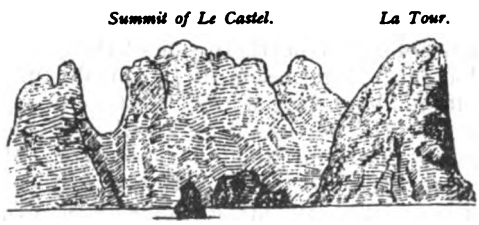
Chart 3875.

Tidal streams.—The tidal streams in Passe de la Mouche are very strong, especially abreast the south-eastern end of Îles des Biches.

Chenal de la Saône.—Dangers.—Chenal de la Saône, in which there is a depth of not less than 14 feet (4m3), is a continuation eastward of Chenal du Ducouëdic (page 336). From a position about 2 cables northward of Le Plumet Vert (page 338), in which Île du Milieu (page 334) is open its own width northward of La Bouée, with

La Bouée, bearing 082°.
(*Original dated* 1886.)

the latter bearing 082°, the channel trends east-south-eastward for about 6½ cables, with l'Enclume (page 338) in line with the summit of Le Castel, bearing 286°, passing between La Bouée, a rock, 16 feet (4m9) high, lying about 3½ cables north-eastward of Le Plumet Vert, which is 97 feet (29m6) high, and Le Plumet Jaune, 93 feet (28m3) high, situated about 2 cables eastward of Le Plumet Vert (page 338).



L'Enclume in line with the summit of Le Castel, bearing 286°.
(*Original dated* 1886.)

Charts 1965, 2062, 2661a, 1263.

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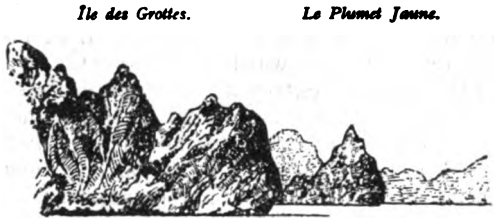
Chart 3875.

The channel then trends south-eastward for a distance of 4 cables, passing close north-eastward of Pointe des Grottes, the northern extremity of Île des Grottes (*Lat. 20° 53′ N., Long. 107° 12′ E.*), which is 494 feet (150m6) high, and lies about half a mile east-south-eastward of Le Plumet Jaune.

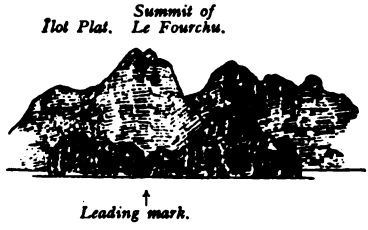
From a position 3 cables east-south-eastward of Pointe des Grottes, the channel again trends east-south-eastward for three-quarters of a mile, with Pointe des Grottes in line with Le Plumer Jaune, bearing 285°.



Pointe des Grottes in line with Le Plumet Jaune, bearing 285°.
(*Original dated* 1886.)

This is the shoalest part of Chenal de la Saône, there being a depth of only 14 feet (4m3) close northward of the last-mentioned alignment.

When the south-eastern extremity of Îlot Plat, situated about 3½ cables west-south-westward of the north-western end of Île des Bîches (page 342), is in line with the summit of Le Fourchu (page 342) bearing 072°, the channel follows that alignment.



The south-eastern extremity of Îlot Plat in line with the summit of Le Fourchu, bearing 072°.
(*Original dated* 1886.)

Le Poisson, an islet, 133 feet (40m5) high, lies on the southern side of this part of the channel, about 2¼ miles south-westward of Île du Milieu, which lies on the northern side of the channel. Two islets lie close off the south-eastern side of Île du Milieu.

From a position about half a mile west-south-westward of Îlot Plat, the channel turns north-eastward with the south-eastern side of Le Vautour, an islet lying about three-quarters of a mile north-eastward of L'Aigle (page 334) in line with the south-eastern extremity of the easternmost of Les Aiglons, a group of islands, lying a short distance southward of L'Aigle, bearing 033°.

On the north-western side of this part of Chenal de la Saône lie Île du Milieu, Île du Chenal (page 334) and La Poire and La Pomme,

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Chart 3875.

two islands close together, about half a mile north-eastward of Île du Chenal. A shoal, with a depth of 11 feet (3m4) over it, lies about 1½ cables north-eastward of Île du Chenal (*Lat. 20° 56′ N., Long. 107° 17′ E.*).

On the south-eastern side of this part of the channel, a shoal, with a depth of 6 feet (1m8) over it, lies about 1¾ cables west-north-westward of the north-western extremity of Île des Bîches. Several islets, the positions of which can best be seen on the chart, lie between the north-western end of Île des Bîches and the island lying close north-westward of Île Kieu, mentioned on page 342. The bank extending from the western end of Van Duoi has been mentioned on page 343. Île Rousse lies northward of Van Duoi, separated from it by Chenal du Roc aux Aigles, about 1¾ cables wide, which is described on page 349. A bank, at the outer end of which there is a depth of 5 feet (1m5), extends about half a mile south-westward from the western end of Île Rousse; Chenal de la Saône passes between these shoals and La Pomme.

Charts 3875, 3876.

From a position about a quarter of a mile eastward of La Pomme, the channel turns north-eastward with the north-western extremity of Le Poisson in line, astern, with the south-eastern extremity of the south-eastern of the two islets lying close south-eastward of Île du Milieu, bearing 229°, and joins Chenal du Bourayne (page 358), about 1¾ miles farther north-eastward.

On the north-western side of this part of the channel, an islet lies southward of Les Aiglons, about half a mile north-westward of the western end of Île Rousse.

On the south-eastern side of this part of the channel, L'Amande, an island, lies about 7 cables north-eastward of the western end of Île Rousse and a quarter of a mile northward of that island. Chenal du Kersaint (page 354) is entered from westward between the northern side of the western part of Île Rousse and L'Amande. La Fourmi, a rock, lies about 1½ cables north-north-eastward of the western extremity of L'Amande. La Régate, an islet, lies about 4 cables farther north-eastward, with an islet midway between it and La Fourmi.

A rock, with a depth of less than 6 feet (1m8) over it, lies close off the western extremity of the last-mentioned islet.

Chenal du Bourayne is entered from south-westward between La Régate and Le Vautour, about one mile north-westward.

Chart 3875.

Chenal du Château Renaud.—Dangers.—Chenal du Château Renaud branches off Chenal de l'Hamelin (*see* page 334) and trends north-eastward between Le Pierrot, an islet, 372 feet (113m4) high, lying about 6 cables eastward of Îlot Frangé (page 330) and Le Nid, an islet with a needle-shaped rock at its northern entremity, about 3 cables southward of Le Pierrot, where it enters Grande Baie des Faï Tsi Long, crosses the bay on its north-western side, and joins Chenal du Bourayne about one mile eastward of L'Aigle.

On the south-eastern side of Chenal du Château Renaud, Île des Singes lies about a quarter of a mile eastward of Le Nid. A rock, with a depth of 13 feet (4m0) over it, lies nearly a quarter of a mile north-north-eastward of the northern extremity of Île des Singes and

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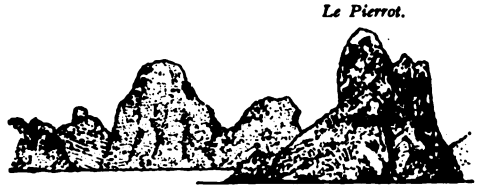
Chart 3875.

about 1½ cables westward of an islet, which is situated 2 cables westward of Le Castel, an islet, 553 feet (168m6) high, which lies about a quarter of a mile north-eastward of Île des Singes ; Le Lapin, an islet, 97 feet (29m6) high, lies about 3¾ cables farther north-eastward. Le Képi (page 337) lies 7 cables east-north-eastward of Le Lapin (*Lat. 20° 54′ N., Long. 107° 09′ E.*).

From a position about a quarter of a mile eastward of Le Pierrot, for a distance of about 1½ miles east-north-eastward, the channel runs with the southern extremity of Le Pierrot, bearing about 249°, in line with an islet lying close north-westward of La Casemate.



The southern extremity of Le Pierrot, bearing about 249°.
(*Original dated* 1886.)

On the north-western side of the channel, L'Eteignoir, an islet, lies about one cable northward of the eastern end of Le Pierrot, with Le Dentelé, an island, 507 feet (154m5) high, about 1½ cables farther northward. Le Marron, a rock, 54 feet (16m5) high, lies about 1¼ miles east-north-eastward of Le Dentelé ; La Voile (page 334) lies nearly 1¾ miles farther east-north-eastward. Some islets, the positions of which can best be seen on the chart, lie on the coastal bank a short distance north-westward of the line joining Le Dentelé and La Voile. Depths of less than 3 fathoms (5m5) extend about 2 cables south-eastward of this line in the vicinity of La Voile.

The northern extremity of Le Nid, bearing 242°, and a little open south-eastward of the southern extremity of La Tourelle.
(*Original dated* 1886.)

From a position about half a mile east-south-eastward of Le Marron (*Lat. 20° 55′ N., Long. 107° 10′ E.*) to a position about half a mile eastward of La Voile, the channel runs with the northern extremity of Le Nid, bearing 242°, a little open south-eastward of the southern extremity of La Tourelle (page 330).

La Misaine, an islet, 175 feet (53m3) high, lies about 4 cables north-eastward of La Voile.

From a position about half a mile eastward of La Voile the channel trends north-eastward for about 1¼ miles, until La Voile, Le Marron, and L'Eteignoir are in line, bearing 244°.

La Voile, Le Marron and L'Eteignoir in line, bearing 244°.
(*Original dated* 1886.)

Charts 1965, 2062, 2661a, 1263.

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Chart 3875.

The channel then follows this alignment in a north-easterly direction for about 1½ miles, and then passes midway between Le Dôme, an islet, 333 feet (101m5) high, situated about 2¾ miles north-eastward of La Voile, and Le Carosse, an islet, 113 feet (34m4) high, about 2¾ cables east-south-eastward of Le Dôme. On the north-western side of this part of the channel, Île de l'Arrête, 228 feet (69m5) high, lies about 1½ cables north-north-eastward of Le Dôme, with Le Chou-fleur, a rock, between them. A rock, which dries 11 feet (3m4), lies nearly one cable south-eastward of Le Chou-fleur.

On the south-eastern side of the channel, Le Spectre, an island, lies about 2 cables eastward of Le Carosse. A bank, with a depth of 13 feet (4m0) over it, extends about one cable northward from the eastern end of Le Spectre; the channel passes between this bank and Roche du Chenal, which dries 3 feet (0m9), and lies about 2 cables northward of Le Spectre.

Between Le Spectre (*Lat. 20° 57′ N., Long. 107° 15′ E.*) and Roche du Chenal, La Voile, Le Marron and L'Eteignoir should be brought again in line (*see* view on page 346).

Le Pot, an islet, lies on the south-eastern side of the channel, about one cable north-eastward of Le Spectre. A rock, with a depth of 13 feet (4m0) over it, lies about one mile north-eastward of Le Pot and 4½ cables north-westward of Le Cône, an island lying one mile east-north-eastward of Le Pot.

In order to pass this rock, from a position about 3 cables north-north-eastward of Le Pot the channel trends in a more northerly direction until the southern extremity of Le Dôme is in line with

The southern extremity of Le Dôme in line with La Voile, bearing 242°.
(*Original dated* 1886.)

La Voile, bearing 242°, and continues in an east-north-easterly direction for about 1¾ miles, passing south-eastward of Le Chien, an islet, situated about 2¼ miles east-north-eastward of Île de l'Arrête. The positions of the other islands which lie on either side of this part of the channel can best be seen on the chart.

Charts 3875, 3876.

From a position about 6 cables eastward of Le Chien the channel trends in a south-easterly direction, passes close north-eastward of L'Aigle (page 334), and joins Chenal du Bourayne, about one mile eastward of that island.

On the northern side of this part of the channel, an islet lies about 2 cables north-north-eastward of the northern extremity of L'Aigle, and Le Vautour (page 344) lies about 6½ cables eastward of this islet, to which it is connected by a bank, over which there are depths of less than 6 feet (1m8). A bank, with a depth of less than 6 feet (1m8) over it, extends about 1½ cables from the eastern side of Le Vautour.

Charts 1965, 2062, 2661a, 1263.

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Charts 3875, 3876.

INNER CHANNELS IN NORTHERN PART OF ARCHIPELAGO.—General description.—There are several channels, some of which are linked by subsidiary channels, between the islands in the northern part of Archipel des Faï Tsi Long. These channels offer considerable advantages, during the North-east monsoon, for shallow-draught and small-powered steamers, with local knowledge. There is a depth of not less than 14 feet (4m3) in the fairway of most of the channels, except at the northern end of Chenal du Duchaffaut, (page 355), where there is a bar, with a depth of 10 feet (3m0) over it, but this bar can be avoided by proceeding to the open sea through Passe de Bruyères and Tsieng Mun (*see* page 372).

Chenal du Lutin.—Dangers.—The western entrance of Chenal du Lutin is connected with Passe de la Mouche, and lies between the north-western extremity of Île Dao Trao (*Lat. 20° 54′ N., Long. 107° 19′ E.*) (page 342), and the western extremity of Île Longue, about one mile north-eastward. It is encumbered by numerous islets, the positions of which can best be seen on the chart. The channel in the entrance is very narrow, with a depth of only 6 feet (1m8) in portions of the fairway, and should not be attempted without local knowledge.

On the southern side of Chenal du Lutin there is an opening into Baie de Quan Lan, between Pointe des Loutres, the south-western extremity of Île de la Table, situated about 3 miles east-south-eastward of the western extremity of Île Longue, and the north-eastern extremity of Île Dao Trao. Several islands lie in this opening, which leads into the channel trending eastward from Passe de la Mouche (page 342).

North-eastward of the south-western extremity of Île de la Table, the depths in Chenal du Lutin become greater. Île Paul, with an islet close south-westward of it, lies in mid-channel about 3 miles north-eastward of Pointe des Loutres. A shoal, with a depth of 5 feet (1m5) over it, lies nearly 3 cables south-westward of the south-western extremity of Île Paul, and between this shoal and the south-western entrance to Port des Sylphes the depths in the navigable channel decrease to less than 18 feet (5m5).

On the south-eastern side of the channel, the south-western entrance of Port des Sylphes, about 1½ cables wide, lies between the south-western extremity of Île des Sylphes, situated about half a mile east-north-eastward of Île Paul, and the northern side of the south-western end of Île de la Table. An islet lies about one cable westward of the south-western extremity of Île des Sylphes, and is connected to it by a ridge which dries.

The northern entrance of Chenal du Lutin lies between Pointe Rita, the north-eastern extremity of Île Longue, and the northern extremity of Île des Sylphes, about 1½ miles north-eastward. A rock, which dries less than one foot (0m3), lies 4 cables north-north-eastward of Pointe Rita. Farther northward the channel connects with Chenal de la Carabine (page 363).

Several islets lie off the northern end of Île des Sylphes, the positions of which can best be seen on the chart.

Port des Sylphes.—Dangers.—Port des Sylphes lies between Îles des Sylphes and Île de la Table. Its south-western entrance is very narrow and has a least depth of 10 feet (3m0) close eastward of the narrowest part of the channel, about 2¾ cables eastward of the south-western extremity of Île des Sylphes.

Charts 1965, 2062, 2661a, 1263.

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Charts 3875, 3876.

A shoal, with a depth of 15 feet (4m6) over it, lies nearly in the middle of the northern entrance and a bank, with depths of less than 12 feet (3m7) over it, extends from Île de la Table, leaving only a very narrow channel between them and the northern end of Île des Sylphes.

The port is only available for small vessels with local knowledge.

Chenal du Roc aux Aigles.—Dangers.—Chenal du Roc aux Aigles branches off Chenal de la Saône about 6 cables eastward of Île du Chenal (page 334), and trends eastward between the banks extending westward from the western ends of Van Duoi (page 343), and Île Rousse (page 345), with Île du Chenal (*Lat. 20° 56′ N., Long. 107° 17′ E.*), astern, just open southward of La Voile, bearing 269°.

Île du Chenal just open southward of La Voile, bearing 269°.
(*Original dated* 1886.)

After passing between these banks the channel trends east-south-eastward midway between Van Duoi and Île Rousse, with La Poire, astern, bearing 285°.

La Poire, bearing 285°.
(*Original dated* 1886.)

A spit, with depths of less than 2 fathoms (3m7) over it, extends about 2 cables from the north-eastern side of Van Duoi, near its eastern end. Ilôt Boisé, 123 feet (37m5) high, lies about one mile east-north-eastward of the western extremity of Île Longue and 2½ cables from the northern side of that island. The northern side of Îlot Boisé is fringed by a bank which dries; and a reef, which dries from 4 to 10 feet (1m2 to 3m0), extends about one cable north-eastward from the eastern extremity of the islet.

A rock, which dries 2 feet (0m6), lies close to the south-eastern side of the channel, about 6 cables north-eastward of Ilôt Boisé, on a bank of coral and large stones, which extends about 4 cables south-westward from the rock.

La Brioche, an islet, 300 feet (91m4) high, lies on the south-eastern side of the channel, about 1½ miles east-north-eastward of Îlot Boisé, with Le Moustique, a rock above water, about midway between. A shoal, with a least depth of 16 feet (4m9) over it, lies about 3½ cables south-westward of La Brioche.

Le Coin is the south-easternmost of a group of islets lying off the eastern side of the northern end of Île Rousse, and is situated, on the north-western side of the channel, 3½ cables northward of La Brioche. La Bûche, one of this group, lies 4½ cables westward of Le Coin; a bank, with depths of less than 3 fathoms (5m5) over it, extends about 3 cables southward from La Bûche; there is an 8-foot (2m4)

Charts 1965, 2062, 2661a, 1263.

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Charts 3875, 3876.

patch on this bank, about 3 cables south-westward of Le Coin. About 1¾ cables northward of Le Coin is Le Canard, an islet, 392 feet (119m5) high, close north-westward of which is Le Carotte, an island, 539 feet (164m3) high, separated from the south-eastern side of Île Rousse by a channel about 1¾ cables wide, with a depth of 7 fathoms (12m8) in the fairway.

From a position about 2¼ cables north-north-westward of the north-western extremity of Îlot Boisé, Chenal du Roc aux Aigles trends in a north-easterly direction for about one mile with the north-western extremity of Le Coin in line with the summit of Roc aux Aigles, bearing 064°, which leads north-westward of the rock lying about 6 cables north-eastward of Le Boisé (*see* view facing page 352).

Le Roc aux Aigles is a steep hill, 638 feet (194m5) high, situated on the north-western side of Île Longue, about 1¾ miles north-eastward of La Brioche (*Lat. 20° 56′ N., Long. 107° 24′ E.*).

From a position about 3½ cables north-westward of Le Moustique, the channel trends eastward to within 2 cables westward of La Brioche, when it trends north-eastward, passing between La Brioche and Le Coin and thence between Le Roc aux Aigles and Le Lapin, a rock, 123 feet (37m5) high, 3¼ cables westward. A bank, with a depth of 25 feet (7m6) over it, lies between La Brioche and Le Lapin, but there is a depth of not less than 26 feet (7m9) in the fairway.

The south-eastern extremity of La Hache in line with La Souris, bearing 043°, leads between Le Lapin and Le Roc aux Aigles. La Hache is an islet, 569 feet (173m4) high, lying about 1¼ miles north-eastward of Le Lapin, and La Souris is a prominent rock, 100 feet (30m5) high, about 2½ miles farther north-eastward.

From a position about 2 cables south-south-westward of La Hache, the channel passes between that islet and Île Plate, with La Souris bearing 042°. Île Plate, 356 feet (108m5) high, with another islet, 159 feet (48m5) high, close north-eastward, lies about 1¼ cables north-westward of the northern end of Île Longue.

La Souris, bearing 042°.
(*Original dated* 1886.)

On the north-western side of the channel, L'Enclume, an islet, 448 feet (136m5) high, lies about 6 cables north-eastward of La Hache with some islets between. Le Marteau, an islet, 418 feet (127m4) high, lies close off the north-western side of L'Enclume.

Between L'Enclume and the islet close north-eastward of Île Plate, Chenal du Roc aux Aigles joins the southern end of Chenal du Lynx, which trends in a north-north-easterly direction. From the same position Chenal de la Carabine trends in a north-easterly direction. Chenal du Lynx is described on page 351 and Chenal de la Carabine on page 363.

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Chenal du Lynx.—Dangers.—Beacon.—From a position about a quarter of a mile eastward of the southern end of L'Enclume, Chenal du Lynx trends in a north-north-easterly direction between L'Isolé, an islet, 159 feet (48m5) high, three-quarters of a mile north-north-eastward of L'Enclume and Le Gamin, a rock, 61 feet (18m6) high, situated 6 cables eastward of L'Isolé. A bank, with depths of less than 3 fathoms (5m5) over it, extends about 3 cables north-eastward from L'Enclume (*Lat. 20° 59′ N., Long. 107° 26′ E.*), but there is a least depth of 19 feet (5m8) in this part of the channel.

Chenal du Lynx from its southern entrance.
(*Original dated* 1886.)

A rock, with a depth of less than 6 feet (1m8) over it, lies close north-eastward of Le Gamin.

Coupure du Colosse (page 362) joins Chenal du Lynx from westward about 4 cables east-north-eastward of L'Isolé.

Le Gland, a rock, 12 feet (3m7) high and difficult to distinguish, lies on the western side of the channel, about 4 cables northward of L'Isolé.

A rock, with a depth of less than 6 feet (1m8) over it, lies close eastward of Le Gland.

Chart 3876.

From a position about 3 cables east-south-eastward of L'Isolé, a channel trending east-north-eastward, and passing close northward of La Souris, connects Chenal du Lynx with Chenal de la Carabine and Chenal Sud.

From the same position, Chenal du Lynx continues north-north-eastward with Îlot Rond, about 4¾ miles north-north-eastward, in line with Le Sphinx, an islet, lying about three-quarters of a mile farther north-north-eastward, bearing about 018°.

Îlot Rond in line with Le Sphinx, bearing about 018°.
(*Original dated* 1886.)

On the south-eastern side of this part of the channel, Île du Sud, an islet, 169 feet (51m5) high, lies about one mile north-eastward of Le Gamin. This islet is the south-westernmost of a large number of islets

Charts 1965, 2062, 2661a, 1263.

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Chart 3876.

which lie off the south-western end of Île Madeleine, about 5 miles north-eastward. La Boule is the westernmost of these islets and lies 8 cables northward of Île du Sud. Le Nègre (*Lat. 21° 03′ N., Long. 107° 29′ E.*), an islet, 185 feet (56m4) high, with a rock, about 9 feet (2m7) high, close off its southern side, lies about 1¼ miles north-north-eastward of La Boule ; all these islands lie on an extensive bank, with depths of 3 fathoms (5m5), or less, over it, extending south-westward from the south-western end of Île Madeleine.

From a position about three-quarters of a mile south-westward of La Boule, Chenal de l'île Coupée (page 353) branches off Chenal du Lynx in a north-easterly direction.

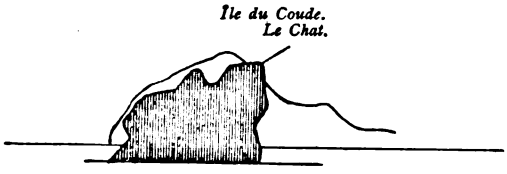
On the western side of this part of Chenal du Lynx, Le Colosse, an island, 727 feet (221m6) high, lies about one mile north-north-westward of L'Isolé. There is a group of islets lying eastward and north-eastward of Le Colosse, the positions of which can best be seen on the chart. The northernmost of this group, with a spit, over which there is a depth of less than 6 feet (1m8), extending about 1½ cables north-eastward from its north-eastern side, lies about 6 cables eastward of the northern extremity of Le Colosse. Roche du Colosse, which dries 2 feet (0m6), lies 7 cables north-north-eastward of the northern extremity of Le Colosse.

Île du Coude, 352 feet (107m3) high, lies on the western side of Chenal du Lynx about 7 cables north-westward of Le Nègre. A chain of islets and shoals extends about 5 miles north-eastward from Île du Coude, and separates Chenal du Lynx from Chenal du Duchaffaut (page 355).

Abreast Île du Coude, Chenal du Lynx trends north-eastward for about 2 miles, with the north-western extremity of Le Castel (page 353) in line with the south-eastern extremity of Le Chat, bearing 046° (*see* view facing this page), and passes between Île de la Saône, 520 feet (158m5) high, situated about one mile north-eastward of Île du Coude, and Récif de l'Echelle, which dries 8 feet (2m4), about 4 cables westward of Île de la Saône. Le Chat, 192 feet (58m5) high, lies about three-quarters of a mile north-north-eastward of Île de la Saône.

A spit, with a depth of less than 3 fathoms (5m5) over it, extends about 2 cables south-westward from Le Chat, and a 3½-fathom (5m9) patch lies close off the north-eastern side of the islet.

From a position about a quarter of a mile south-westward of Le Chat, that islet is rounded at a distance of about half a cable from its eastern side, and, from a position about a quarter of a mile north-eastward of the islet, the channel continues in a north-easterly direction with the south-eastern extremity of Le Chat, astern, in line with the south-eastern extremity of Île du Coude, bearing 226°.



The south-eastern extremities of Le Chat and Île du Coude in line, bearing 226°.
(*Original dated* 1933.)

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Summit of Roc aux Aigles, bearing 064°, in line with north-western side of le Coin.

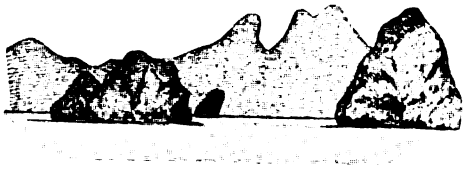
Chenal du Roc aux Aigles.

North-western extremity of Le Castel in line with the south-eastern extremity of Le Chat ,bearing 040°.

Chenal du Lynx.

Île de la Plage. *Île du Grand Singe.*
The partly-wooded summit of Île du Grand Singe in line with the south-eastern extremity of Île de la Plage, bearing 035°.

Chenal du Duchaffaut.



La Dent. *Le Pouce.* *Le Colosse.*
Le Pouce in line with south-eastern side of La Dent, bearing 063°.

Chenal du Bourayne.

(*Originals dated* 1886.)

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Chart 3876.

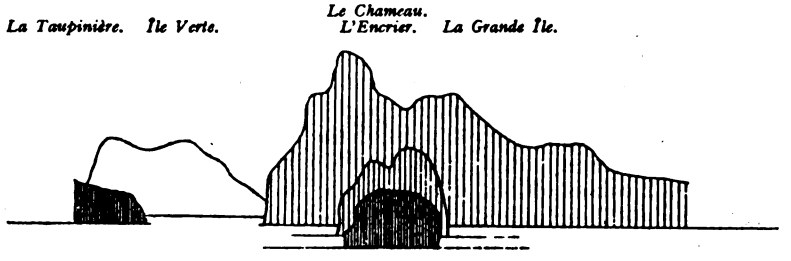
On the south-eastern side of this part of the channel, Le Diadème (*Lat. 21° 05′ N., Long. 107° 31′ E.*), an islet, lies about 1¾ miles north-eastward of Île de la Saône, connected to the latter by a bank, on the north-western edge of which are some islets and rocks. La Grande Île, 694 feet (211m5) high, lies about 3 cables north-eastward of Île de la Saône. Le Diadème and La Grande Île both lie on a bank, with depths of 3 fathoms (5m5), or less, over it, extending from the north-western side of Île Madeleine.

On the north-western side of the channel, Basse du Diadème, with a depth of 17 feet (5m2) over it, lies 3 cables north-westward of Le Diadème, and Basse du Lynx lies about 2½ cables westward of Basse du Diadème.

Basse du Lynx is marked by a tower-shaped beacon, painted in red and black horizontal bands, and surmounted by a sphere.

Le Lion, an islet, 316 feet (96m3) high, lies 7 cables north-westward of Le Diadème, and Île Noire, 280 feet (85m3) high, lies 3¾ cables northward of Le Lion. Le Pâté, an islet, 274 feet (83m5) high, and Le Donjon, 290 feet (88m4) high, lie about one mile and 1½ miles, respectively, north-eastward of Île Noire, and about one mile off the south-eastern side of Île de Ké Bao (page 357). These islets lie on the bank, with depths of 3 fathoms (5m5), or less, over it, separating Chenal du Lynx from Chenal du Duchaffaut.

After passing between Basse du Diadème and Le Diadème, Chenal du Lynx takes a more northerly direction and passes between Le Donjon and Le Castel, an islet, 359 feet (109m4) high, 8 cables eastward, with L'Encrier, in line with Le Chameau, astern, bearing 199°, joining Chenal du Duchaffaut (page 355), about 9 cables north-north-eastward of Le Donjon. L'Encrier is an islet, 123 feet (37m5) high, lying about 1½ cables south-eastward of Le Diadème. Le Chameau, an islet, 156 feet (47m5) high, lies 3½ cables south-south-westward of L'Encrier.



L'Encrier in line with La Chameau, bearing 199°.
(*Original dated* 1933.)

Chenal de l'île Coupée.—Danger.—Chenal de l'île Coupée is only available for shallow-draught vessels with local knowledge; it branches off Chenal du Lynx in a north-easterly direction as described on page 352, and leads between the shoals extending from the south-western end of Île Madeleine, and the bank extending south-south-westward from Le Négre, passing close north-westward of La Boule.

Abreast Île Coupée, 828 feet (252m4) high, lying close off the south-western end of Île Madeleine, the channel trends in a more easterly direction and passes between the latter island and the islands and

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Chart 3876.

shoals lying southward and south-eastward of La Grande Île (*Lat. 21° 04′ N., Long. 107° 30′ E.*). La Taupinière, 126 feet (38m4) high, and Île Verte, 310 feet (94m4) high, are two of the islands lying south-eastward of La Grande Île (*see* view on page 353). The channel then trends northward and passes eastward of L'Encrier and joins Chenal du Lynx about one mile southward of Le Donjon. Basse de l'Encrier, with a depth of 3 feet (0m9) over it, lies about 2½ cables north-north-eastward of L'Encrier.

Charts 3875, 3876.

Chenal du Kersaint.—Dangers.—Beacon.—Buoy.—Chenal du Kersaint, in the fairway of which is a least depth of 4 fathoms (7m3), branches off Chenal de la Saône about 3 cables north-westward of the western end of Île Rousse (page 345) and trends eastward between that island and L'Amande (*Lat. 20° 57′ N., Long. 107° 20′ E.*) for about 2 miles with the southern extremity of L'Escalier, astern, bearing 270°, just open northward of the northern extremity of La Pomme (page 344). L'Escalier is the south-westernmost of a group of islands and lies about 1¼ miles westward of La Pomme.

L'Escalier

L'Escalier, bearing 270°, just open northward of the northern extremity of La Pomme.

(*Original dated* 1886.)

A rock, with a depth of 2 fathoms (3m7) over it, marked on its south-eastern side by a black conical buoy, surmounted by a cylinder, lies close northward of this alignment, about one cable southward of L'Amande, and is avoided by bringing the southern extremity of L'Escalier in line with the northern extremity of La Pomme. La Limace, an island, lies on the northern side of the channel, 8½ cables east-north-eastward of L'Amande, with an islet midway between.

Some shoals, which partly dry, lie on the southern side of the channel about half a mile southward and south-south-westward of La Limace and nearly 2 cables off the northern side of Île Rousse.

A 22-foot (6m7) shoal lies on the northern side of the fairway, about 4 cables south-eastward of La Limace.

Abreast the shoals southward of La Limace the channel trends north-eastward, with the summit of Le Colosse (page 352), bearing about 051°, until about 1¼ miles south-westward of that island, when it takes a more northerly direction for about half a mile and joins Chenal du Duchaffaut at its south-western entrance (page 355).

On the north-western side of this part of the channel, Île Boisée lies about one mile north-eastward of La Limace, with shallow water between. Le Doigt, a rock, above water, lies 4 cables eastward of the northern extremity of La Limace. Le Capitole, an islet, lies about 1½ cables south-south-eastward of Île Boisée, and two other islets lie 1½ and 2½ cables, respectively, south-south-westward of the same island. The south-eastern entrance of a channel which connects

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Charts 3875, 3876.

Chenal du Bourayne with Chenal du Kersaint, lies between Île Boisée and La Toque, a rock, about 4 cables east-north-eastward. The positions of the remainder of the islands and rocks which lie on this side of the channel and extend for about 2½ miles north-eastward from La Toque can best be seen on the chart, and are more fully described with Chenal du Bourayne, page 358.

On the south-eastern side of Chenal du Kersaint, some detached reefs lie close off the northern extremity of Île Rousse, and a rock, with a depth of 15 feet (4m6) over it, lies 2 cables northward of the same point. La Licorne, an islet, 257 feet (78m3) high, lies 7 cables north-eastward of Île Rousse. Basse de la Licorne, with a depth of 9 feet (2m7) over it, lies about one cable westward of La Licorne and a spit, with depths of less than 3 fathoms (5m5) over it, extends a quarter of a mile west-south-westward from the islet.

A channel which connects Chenal du Kersaint with Coupure du Colosse (page 362) leads in an east-north-easterly direction between the north-eastern end of Île Rousse and La Licorne.

L'Index du Kersaint (*Lat. 20° 59′ N., Long. 107° 25′ E.*), an island 356 feet (108m5) high, lies about 1¼ miles north-eastward of La Licorne, with several islands and rocks between, the largest of which is L'Aiglon, 389 feet (118m6) high, about 3 cables from La Licorne. Le Dôme, an island, 405 feet (123m4) high, lies half a mile north-eastward of L'Index du Kersaint, with shallow water between. An islet, 130 feet (39m6) high, lies about one cable northward of Le Dôme and three islets lie off its north-eastern side, the outermost, 67 feet (20m4) high, at a distance of about half a mile.

A rocky shoal, which dries 11 feet (3m4), lies about 4 cables northward of Le Dôme. This shoal is marked by a tower-shaped beacon, 9 feet (2m7) high, painted with red and black horizontal bands and surmounted by a sphere.

About 1½ cables westward of the last-mentioned shoal, Chenal du Kersaint connects with the south-western end of Chenal du Duchaffaut, and is also joined by the north-eastern end of Coupure du Bourayne, page 359.

Chart 3876.

Chenal du Duchaffaut.—Dangers.—From its south-western entrance, mentioned above, Chenal du Duchaffaut trends in a north-north-easterly direction between islands and rocks lying off the south-eastern side of Île de Ké Bao for a distance of about 6 miles and thence along the south-eastern side of that island, about half a mile offshore, as far as the southern entrance point of Cua Mo, about 10 miles farther north-north-eastward, where it gives access to the sea. Off the last-mentioned point there is a bar, over which there is a depth of 15 feet (4m6), which is the shoalest part of the channel.

The southern part of Chenal du Duchaffaut runs between Le Colosse (page 352) and Le Maillet, an island, 208 feet (63m4) high, about half a mile westward, with L'Isolé bearing 033° and open north-westward of an islet lying close westward of Île aux Éboulis. L'Isolé is an islet, 146 feet (44m5) high, situated near the edge of the coastal bank, about 4½ miles north-north-eastward of Le Colosse and half a mile offshore; Île aux Éboulis lies about 2½ miles south-south-westward of L'Isolé.

There are islets on both sides of the channel, the positions of which can best be seen on the chart. Roche du Colosse (*Lat. 21° 02′ N.,*

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Chart 3876.

L'Isolé. Île aux Éboulis.

L'Isolé, bearing about 033°, and open north-westward of Île aux Éboulis.
(*Original dated* 1886.)

Long. 107° 27′ E.), about 7 cables north-north-eastward of the northern extremity of Le Colosse, is described on page 352. From a position about half a mile north-westward of this rock the channel takes a more northerly direction, and passes between Île aux Trois Sommets, about one mile northward of Le Colosse and Île du Chenal, about 1¼ cables southward of Île aux Éboulis. A bank, with a least depth of 2 feet (0m6) over it, extends 1¾ cables westward from Île du Chenal, and about 7 cables south-south-westward, with depths of from 6 to 18 feet (1m8 to 5m5) over it. An islet lies close northward of Île aux Trois Sommets. From a position about half a mile north-eastward of this islet the channel trends in a more north-easterly direction, with

L'Isolé.

L'Isolé bearing 037°.
(*Original dated* 1886.)

L'Isolé bearing 037°, passing north-westward of Île aux Éboulis, and about midway between that island and Le Marron, an islet, 64 feet (19m5) high, lying about half a mile north-westward, and about 1¼ miles offshore.

Some islets lie north-westward of Le Marron, between it and the south-eastern side of Île de Ké Bao. Le Doigt, 208 feet (63m4) high, is the southernmost of a group of islets lying about 6½ cables north-north-eastward of Le Marron. Rocher de la Pointe, 48 feet (14m6) high, lies on the edge of the coastal bank, about one mile north-eastward of Le Doigt and 3½ cables offshore.

On the south-eastern side of the channel Îlot Rond (page 351) lies on the bank with depths of less than 3 fathoms (5m5) over it, about 8 cables north-eastward of Île aux Éboulis, with another islet between them. A shoal, with a depth of 16 feet (4m9) over it, lies close south-eastward of the fairway about 6½ cables westward of Îlot Rond.

Two 3-fathom (5m5) patches lie in the fairway of the channel, 4 cables south-eastward and 8 cables east-north-eastward, respectively, of Rocher de la Pointe. The coastal bank, on the edge of which there are depths of 11 feet (3m4), extends about half a mile offshore about 8½ cables north-eastward of Rocher de la Pointe.

From a position about half a mile south-south-westward of L'Isolé, the channel passes between that islet and a rock, 8 feet (2m4) high, about one cable east-south-eastward, and then trends in a more

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Chart 3876.

easterly direction, with L'Isolé in line with Rocher de la Pointe, astern, bearing 236°.

L'Isolé in line with Rocher de la Pointe, bearing 236°.
(*Original dated* 1886.)

Basse de l'Isolé, with a depth of 9 feet (2^{m}7) over it, lies on the south-eastern side of the channel, about 3 cables eastward of L'Isolé (*Lat. 21° 06′ N., Long. 107° 29′ E.*); about 2 cables northward of Basse de l'Isolé, there are depths of only 17 feet (5^{m}2) in the fairway of the channel.

A 14-foot (4^{m}3) patch lies on the coastal bank, on the north-western side of the fairway, about half a mile westward of Le Pâté (page 353).

About 8½ cables north-eastward of Le Donjon, Chenal du Duchaffaut is joined by Chenal du Lynx.

Ké Bao, a village, where there is an outcrop of coal, stands on the south-eastern side of the island of that name, 3¼ miles north-eastward of Rocher de la Pointe. The mouth of a river, the bar of which dries, is situated close southward of the village.

The coastal bank, with depths of less than 3 fathoms (5^{m}5) over it, between Ké Bao village and Île Bourayne, 54 feet (16^{m}5) high, 2¼ miles north-eastward, extends about a quarter of a mile offshore. Île Bourayne lies near the edge of this bank, connected with the coast by a bank, which dries 8 feet (2^{m}4). Île Duchaffaut, 84 feet (25^{m}6) high, lies about 3 cables north-eastward of Île Bourayne, connected with the coast by a drying bank. A reef, on which there are some islets, extends a quarter of a mile north-eastward from Île Duchaffaut, and a rock, which dries 10 feet (3^{m}0), lies about one cable farther north-eastward.

On the south-eastern side of the channel, an islet, 71 feet (21^{m}6) high, lies about one cable north-north-eastward of Le Castel (page 353). Île aux Bambous, 782 feet (238^{m}4) high, lies about 8 cables north-eastward of Le Castel. Le Panier, a rock, 34 feet (10^{m}4) high, lies 8½ cables north-north-eastward of Le Castel and a quarter of a mile off the western side of Île aux Bambous; a rock, with a depth of 4 fathoms (7^{m}3) over it, lies about 1½ cables north-westward of Le Panier. A reef, near the extremity of which is a rock above water, extends about one cable northward from the northern extremity of Île aux Bambous.

Charts 3876, 3877.

Île aux Bambous is separated from Île aux Bruyères, which is 251 feet (76^{m}5) high, by Petite Passe des Bruyères, about one cable wide. A reef, on which are two rocks, above water, extends about 1½ cables north-eastward from the northern extremity of Île aux Bruyères. Passe des Bruyères (page 375) enters the channel close north-eastward of Île aux Bruyères, and between the latter and Île Longue, about 2 miles north-eastward. A bank, with depths of less than 3 fathoms (5^{m}5) over it, extends about 1½ miles south-westward

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Charts 3876, 3877.

from Île Longue ; near the extremity of this bank are some rocks, one of which dries 9 feet (2m7), and a patch, with a depth of 8 feet (2m4) over it, lies about half a mile north-westward of this rock. A bank, with depths of less than 3 fathoms (5m5) over it, extends about one mile from the north-western side of Île Longue. A 5-foot (1m5) patch lies on this bank about 8½ cables north-north-westward of the northern extremity of Île Longue ; between this patch and the north-eastern extremity of Île de Ké Bao there are depths of from 7 to 15 feet (2m1 to 4m6). The bank, which extends from the north-western side of Île Longue, is composed of hard sand and gravel ; between its western edge and the coast of Île de Ké Bao there is a channel about half a mile wide, with a least depth of 15 feet (4m6) in the fairway at the northern end.

On the north-western side of the channel, Rivière de l'Antilope discharges about 2¾ miles north-eastward of Île Duchaffaut (*Lat. 21° 09′ N., Long. 107° 32′ E.*). A shoal, with a depth of 14 feet (4m3) over it, lies about 1½ miles farther north-eastward and about 3 cables offshore. The south-eastern extremity of Île de la Plage, in line with the partly wooded summit of Île du Grand Singe, bearing 035°, leads close south-eastward of this shoal ; Île de la Plage lies about 1¼ miles north-eastward of the north-eastern extremity of Île de Ké Bao and the summit of Île du Grand Singe lies about 3½ miles farther north-eastward. (*See* view facing page 352.)

The southern entrance point of Cua Mo lies about 3 miles north-eastward of the mouth of Rivière de l'Antilope, and is the north-eastern extremity of a mountainous peninsula which juts out from the north-eastern side of Île de Ké Bao ; Sommet Double, the highest part of this peninsula, is 1,389 feet (423m4) high, and lies about 2½ miles south-westward of the extremity of the peninsula.

Cua Mo is described on page 379.

Anchorage.—Vessels can anchor between Île aux Bambous and Île de Ké Bao.

Charts 3875, 3876.

Chenal du Bourayne.—Dangers.—Vessels should not use Chenal du Bourayne, in which there is a depth of 15 feet (4m6) at its north-eastern end, without local knowledge. From its south-western entrance (page 345), Chenal du Bourayne trends for about 3½ miles with the south-eastern extremity of La Dent, an islet situated about 4 miles east-north-eastward of Le Vautour, in line with Le Pouce, a rock, 77 feet (23m5) high, about 5 cables farther east-north-eastward, bearing 063°. (*See* view facing page 352.)

On the south-eastern side of this part of the channel are several islets and rocks ; L'Abeille, an islet, with a 14-foot (4m3) patch close off its north-eastern side, lies 8½ cables north-eastward of La Régate. La Ruche, a rock, with a depth of 5 feet (1m5) over it, with an islet close south-westward, lies about 7 cables farther north-eastward. Le Hoggar, an island, lies about 8 cables east-north-eastward of La Ruche. A bank, with depths of less than 3 fathoms (5m5) over it, extends about 4 cables south-westward from Le Hoggar. Le Lézard, an islet, lies about three-quarters of a cable south-westward of the extremity of this bank, and Le Hérisson, a rock, above water, lies on the bank midway between Le Lézard and Le Hoggar. Le Bourgeois and La Molaire, islets, lie about 2½ and 7½ cables, respectively, north-eastward

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Charts 3875, 3876.

of Le Hoggar, connected with it by shallow water. A channel passes north-eastward of La Ruche and between Le Lézard and Île Boisée, about 2 cables south-south-eastward, and connects Chenal du Bourayne with Chenal du Kersaint.

On the north-western side, Chenal de Cam Pha branches off Chenal du Bourayne in a north-easterly direction about 7 cables south-eastward of Le Corbeau, an islet, situated 1½ miles east-north-eastward of Le Vautour, and passes close south-eastward of Les Ours, a group of islets, lying about 8 cables farther east-north-eastward. Several islets lie northward and north-eastward of Le Corbeau, the positions of which can best be seen on the chart. Le Bouton, a rock, above water, lies on the south-eastern side of Chenal de Cam Pha, about one mile east-north-eastward of Les Ours. A bank, part of which dries, extends about one mile south-westward from Le Bouton; near the south-western end of this bank is a depth of 2 feet (0m6), situated only 2 cables north-westward of the fairway of Chenal du Bourayne. Some islands lie north-north-eastward of Le Bouton, the positions of which can best be seen on the chart.

From a position about 2 cables north-westward of La Molaire, Chenal du Bourayne trends in a more easterly direction for about half a mile and passes between La Dent (*Lat. 21° 00′ N., Long. 107° 23′ E.*) and the north-westernmost of a group of islets lying about a quarter of a mile east-south-eastward, when it again trends in a more northerly direction and passes close south-eastward of Le Pouce. A bank, with a depth of 5 feet (1m5) over it, extends south-westward from the last-mentioned group of islets as far as La Molaire; Le Navet, an island, lies about 1½ cables north-eastward of the group of islets, with depths of less than 6 feet (1m8) between. A bank, with depths of less than 6 feet (1m8) over it, extends about 3 cables north-eastward from Le Navet; on the north-eastern extremity of this bank there is a island, 284 feet (86m6) high. A rock, 152 feet (46m3) high, with a sunken rock close westward, lies midway between the island and Le Navet. There is a depth of 13 feet (4m0) three-quarters of a cable north-westward of this rock, leaving a channel only about one cable between it and Le Pouce.

On the north-western side of the channel, an islet, 136 feet (41m5) high, with depths of less than 6 feet (1m8) extending a short distance from its eastern side, lies about one cable north-north-eastward of Le Pouce. South-eastward of this islet is the shoalest part of the channel. A shoal, with a depth of 15 feet (4m6) over it, lies on the north-western side of the fairway about half a cable south-eastward of the islet, and a shoal, with a depth of 13 feet (4m0) over it, lies on the south-eastern side of the fairway, about 1¼ cables from the same islet. A depth of 15 feet (4m6) can, however, be carried through this part of the channel.

From a position 2 cables east-north-eastward of Le Pouce (*Lat. 21° 00′ N., Long. 107° 24′ E.*), Coupure du Bourayne, a continuation of the channel of the same name, leads in an east-north-easterly direction for about one mile, with Le Pouce, astern, bearing 251°, between two islets, the southern of which is La Dent, and joins Chenal du Duchaffaut about 1½ cables westward of the rocky shoal, situated about 4 cables northward of Le Dôme (page 355).

A bank, over which there is a depth of 15 feet (4m6) in the fairway, extends across Coupure du Bourayne, from the 284-foot (86m6) high

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Charts 3875, 3876.

island, to a rock, 103 feet (31m4) high, about half a mile north-eastward. Many islands and rocks lie northward and westward of this rock, the positions of which can best be seen on the chart.

Le Pouce, bearing 251°, between two islets.
View in Chenal du Bourayne.
(Original dated 1933.)

Chenal de Cam Pha. — Dangers. — Beacons. — Buoys. — Lights.—Chenal de Cam Pha leads to the port of Cam Pha, which has been constructed for the export of coal from the mines in the vicinity. The port is accessible for vessels drawing 26 feet (7m9). Northward of the Port of Cam Pha the channel leads towards Tien Yen, about 17 miles northward, and is available for shallow draught vessels only at high water (chart 1965).

Chenal de Cam Pha is entered between Les Ours (*Lat. 20° 59′ N., Long. 107° 21′ E.*) and the extremity of the bank extending south-westward from Le Bouton. On the western side, Île de l'Angle lies about 6½ cables north-north-eastward of Les Ours and on the outer edge of a bank, which partly dries, extending about 9 cables offshore. Some islets lie on this coastal bank a short distance north-westward and south-westward of Île de l'Angle, the positions of which can best be seen on the chart. The outer edge of this bank has a depth of 3 fathoms (5m5) or less over it, and lies between Île de l'Angle and the wharf at Cam Pha, a town situated on the mainland about 1¾ miles northward. The edge of the bank eastward of Île de l'Angle is marked by a conical beacon.

A conical buoy, with a topmark, is moored about a quarter of a cable off the eastern extremity of Île de l'Angle.

On the eastern side of the channel, Les Lèvres, two islands, lie 2 cables north-north-eastward of Le Bouton. Le Nez, an island, with a rock, close off its south-western side, and two islands close off its north-eastern side, lies about 3 cables north-north-eastward of Les Lèvres.

Three pairs of leading lights are established in the approach to the Port of Cam Pha.

The front light of the southernmost pair is occasionally exhibited, at an elevation of 30 feet (9m1), from a white square beacon, with black bands, about 38 feet (11m6) in height, situated near the edge of the drying bank, 2 cables westward of Le Nez. The rear light is occasionally exhibited, at an elevation of 43 feet (13m1), from a similar structure, about 52 feet (15m8) in height, situated about 4 cables north-eastward of the front light. These lights in line bear 035°.

The two inner pairs of leading lights are exhibited only on request of the pilot. The middle pair is situated on the eastern bank eastward of the wharf at Cam Pha, and the inner pair at the southern end of Île Jaune.

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The front light of the middle pair is exhibited, at an elevation of 31 feet (9m4), from a white square beacon with black bands, about 49 feet (14m9) in height. The rear light is exhibited, at an elevation of 42 feet (12m8), from a similar structure, about 60 feet (18m3) in height, about 3½ cables north-north-eastward of the front light. These lights in line bear 018°.

The front light of the inner pair is exhibited, at an elevation of 45 feet (13m7), from a white square beacon with black bands, about 66 feet (20m1) in height. The rear light is exhibited, at an elevation of 60 feet (18m3), from a rectangular masonry wall, about 8 feet (2m4) in height, on the southern end of Île Jaune, about 50 yards (45m7) northward of the front light. These lights in line bear 358°.

The south-western extremity of Île de Ké Bao lies about 2 miles northward of Le Nez, and Île Verte lies about 2 cables south-south-westward of the same extremity. A spit, which dries, extends about half a mile southward from Île Verte, and on the spit, about 2 cables from the island, is a rock, 3 feet (0m9) high. A rocky patch, on which are three rocks above water, close together, lies one cable eastward of Île Verte, on the north-western end of an extensive drying bank which lies close off the south-western end of Île de Ké Bao and extends southward as far as Le Bouton. The western edge of this bank is over 2 cables westward of Le Nez, Les Lèvres and Le Bouton (*Lat. 21° 00′ N., Long. 107° 22′ E.*).

A rocky shoal, with a depth of 19 feet (5m8) over it, lies 3 cables southward of the wharf at Cam Pha, and about half a cable eastward of the edge of the bank.

Île Jaune, fringed by a drying bank, divides Chenal de Cam Pha into two and lies about 2 cables north-eastward of Cam Pha. Cua Ong is the western of these two channels, and Cua Dong the eastern. A spit, with a depth of 7 feet (2m1) over it, extends about 1¼ cables southward from the island, and a bank, with depths of less than 6 feet (1m8) over it, extends about 1½ cables from the western side. Some rocks, 8 feet (2m4) high, lie about 1¾ cables north-north-westward of the western extremity of Île Jaune.

A rock, with a depth of 2 fathoms (3m7) over it, lies about 3½ cables northward of the southern extremity of the wharf at Cam Pha and about half a cable offshore.

Cua Dong leads between Île Jaune and Île Verte. A bank, with depths of less than 3 fathoms (5m5) over it, extends eastward from the northern end of Île Jaune nearly to the middle of the fairway.

A red and white conical buoy is moored on the western side of the channel about 1½ cables north-westward of Île Verte.

Île Parseval, 372 feet (113m4) high, lies close northward of Île Jaune. The depths in the channel on the eastern side of Île Parseval are from 15 to 42 feet (4m6 to 12m8), and on the western side from about 6 to 12 feet (1m8 to 3m7).

Tidal streams.—The tidal streams are strong. In the southern part of the channel, the tidal stream sets in a south-westerly direction on the falling tide. Abreast the wharf, the tidal streams set northward and southward, and the south-going stream attains a rate of 3 knots.

Anchorage.—There is good anchorage in the northern part of the channel, in depths of from 3¼ to 5½ fathoms (5m9 to 10m1), but there is little swinging room.

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Charts 3875, 3876.

Pilotage.—Directions.—Pilotage is compulsory. In order to enter the Port of Cam Pha, vessels must previously make a request for a pilot from Hongay, who will embark near Le Dragon, in Passe Henriette (page 325).

From the position in which Chenal de Cam Pha branches off Chenal du Bourayne, vessels should proceed on the alignments of the three pairs of leading light-structures until abreast the wharf and then either make fast to the wharf or proceed to the anchorage.

Cam Pha.—Port facilities.—The wharf at Cam Pha is 984 feet (299^{m}9) long, and two vessels can lie alongside. There are four transporters on the wharf, each capable of delivering coal at a rate of 125 tons an hour. There is a depth of 26 feet (7^{m}9) alongside.

There is also a quay, 180 feet (54^{m}9) long, chiefly used by junks, with a depth of 13 feet (4^{m}0) alongside; on it are two steam cranes, each with a lifting capacity of 8 tons.

The Custom-house official carries out the duties of a medical officer. Water is laid on to the wharf (*Lat. 21° 02′ N., Long. 107° 22′ E.*). In case of accident a private infirmary can give first aid.

Communication.—There is regular communication by small vessels with Haïphong and Mon-Cay.

Cam Pha is connected to the general telegraph system.

Coupure du Colosse.—Dangers.—The channel which connects Chenal du Kersaint with Coupure du Colosse (*see* page 355) is a continuation of the channel which connects the former with Chenal du Bourayne (*see* page 358). It leads close northward of the rock, with a depth of 15 feet (4^{m}6) over it, which lies 2 cables northward of the northern extremity of Île Rousse, by keeping Le Moineau, a rock, 18 feet (5^{m}5) high, one mile eastward of the same extremity, in line with the southern extremity of La Scie, an islet, 307 feet (93^{m}6) high, about 1½ miles farther eastward, bearing 087°. After passing the rock, the alignment leads close southward of Basse de la Licorne (page 355), and continues eastward until about 3½ cables westward of Le Moineau, where it joins the south-western end of Coupure du Colosse and trends north-eastward between Le Moineau and La Licorne.

On the north-western side of this part of Coupure du Colosse are the islets lying between La Licorne and L'Index du Kersaint, described on page 355. An islet, 146 feet (44^{m}5) high, with a bank, with depths of 3 feet (0^{m}9) over it, extending a short distance from its southern side, lies close to the north-western side of the fairway, about 3 cables southward of L'Index du Kersaint. Basse du Kersaint, with a depth of 15 feet (4^{m}6) over it, lies about 3½ cables eastward of L'Index du Kersaint.

On the south-eastern side of this part of the channel, La Clef, an islet, 195 feet (59^{m}4) high, lies about 4 cables eastward of L'Aiglon. La Clef is the largest and north-westernmost of a group of islets, the positions of which can best be seen on the chart. The northernmost islet of this group, 107 feet (32^{m}6) high, lies 4 cables north-eastward of La Clef. A spit, with a depth of 11 feet (3^{m}4) over it, extends a short distance from the north-western side of La Clef; and Basse de la Coupure, with a depth of 13 feet (4^{m}0) over it, lies close to the south-eastern side of the channel, about one mile north-eastward of La Clef.

From a position about half a mile eastward of Le Dôme (page 355),

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Charts 3875, 3876.

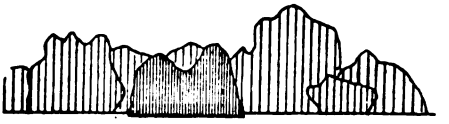
Coupure du Colosse trends eastward, and passing northward of L'Isolé (page 351), joins Chenal du Lynx as described on page 351.

Le Dôme is connected with the islets lying close south-eastward of Le Colosse by a bank, over which there are depths of less than 2 fathoms (3m7).

The channel connecting Chenal du Lynx with Chenal de la Carabine is mentioned on page 351.

The pecked line on the chart indicating the channel through Coupure du Colosse need not be strictly adhered to. Vessels with local knowledge after passing the 107-foot (32m6) high islet, 4 cables north-eastward of La Clef, can steer with the summit of L'Aiglon, astern, bearing 251°, open northward of the 107-foot (32m6) islet, and pass southward of Basse de la Coupure, and between L'Isolé and Le Gamin; or, if proceeding into Chenal de la Carabine, they should continue on the same alignment, passing between the latter and La Souris.

L'Aiglon.



The summit of L'Aiglon open northward of the 107-foot (32m6) high islet, bearing about 251°.
(*Original dated* 1933.)

Chenal de la Carabine.—Chenal de la Carabine is a continuation north-eastward of Chenal du Roc aux Aigles (page 349).

Vessels approaching from northward through Chenal du Lynx, should keep Le Gland (page 351) astern and in line with the north-eastern peak of Le Triangle, bearing 284°. Le Triangle, 323 feet (98m4) high, is the southern of two islands, lying close together, about 2½ miles west-north-westward of Le Gland.

Le Gland.

Le Gland in line with the north-eastern peak of Le Triangle, bearing about 284°.
(*Original dated* 1933.)

This will lead south-westward of the bank extending south-westward from Île du Sud (*Lat. 21° 01′ N., Long. 107° 28′ E.*). *Chart 3876.*

About 2 cables north-eastward of La Souris, Chenal de la Carabine is divided into two channels, named Chenal Nord and Chenal Sud, separated from one another by three islets lying on a bank, with depths of from one to 3 fathoms (1m8 to 5m5) over it, which lies from 3 to 7 cables off the north-western side of Île de la Table (page 348). La Meurtrière, 241 feet (73m5) high, the south-westernmost of these islets, lies about 2½ miles north-eastward of La Souris; La Chimère, 313 feet (95m4) high, lies 8½ cables north-eastward of La Meurtrière, and Le

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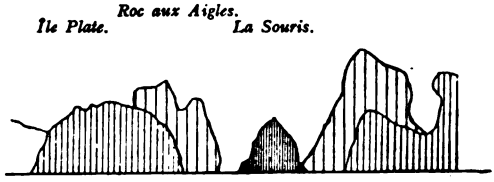
Chart 3876.

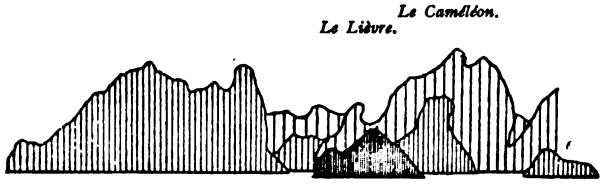
Shako, 142 feet (43m3) high, the north-easternmost of the three islets, lies about a quarter of a mile north-north-eastward of La Chimère.

Chenal Nord.—Dangers.—Chenal Nord, in the fairway of which there is a least depth of 22 feet (6m7), lies between the islets lying on the shallow bank which extends south-westward from Île Madeleine (page 352), and the three islets mentioned above. La Fourmi, a rock 18 feet (5m5) high, lies on the north-western side of the channel, close off the edge of the shallow bank, about 6 cables north-eastward of Île du Sud. A rock, awash, lies on the south-eastern side of the channel, 2 cables south-westward of La Meurtrière. A notch, near the summit of Roc aux Aigles (page 350) in line with the north-western extremity of Île Plate, astern, bearing 223°, leads between this rock and La Fourmi, and south-eastward of Le Lièvre (*Lat. 21° 02′ N., Long. 107° 29′ E.*), an islet, 77 feet (23m5) high, lying about one mile north-eastward of La Fourmi.



A notch near the summit of Roc aux Aigles in line with the north-western extremity of Île Plate, bearing 223°.
(*Original dated* 1933.)

After passing Le Lièvre, the channel takes a more easterly direction for a distance of about 1½ miles, with the south-eastern extremity of Le Lièvre, astern, in line with the south-eastern extremity of Le Caméléon, bearing 238°; Le Caméléon is an islet about one mile south-westward of Le Lièvre.



The south-eastern extremity of Le Lièvre in line with the south-eastern extremity of Le Caméléon, bearing 238°.
(*Original dated* 1933.)

From a position 6 cables north-eastward of Le Shako, the channel takes a still more easterly direction for a distance of about one mile, with the southern extremity of Le Château-Fort in line with Le Huron, an islet lying about 1½ miles farther eastward, bearing 083°. Le Huron is inconspicuous in the morning during fine weather; Le Château-Fort, an islet, 208 feet (63m4) high, lies about 2 miles east-north-eastward of Le Shako.

La Touffe, an islet, 44 feet (13m4) high, with a white rock on its southern end, lies on the northern side of this part of the channel, 8½ cables westward of Le Château-Fort (*Lat. 21° 03′ N., Long. 107° 33′ E.*). A bank, with a depth of 10 feet (3m0) over it, extends about

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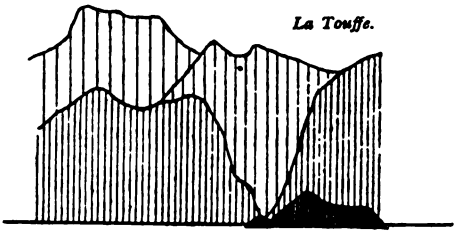
Chart 3876.

one cable from the western side of La Touffe, and a bank, with a depth of 15 feet (4m6) over it, extends about the same distance from the eastern side. A shoal, with a least depth of 3 feet (0m9) over it, lies about 1½ cables southward of La Touffe; the alignment for the channel given above leads between the islet and this shoal. A shoal, with a least depth of 9 feet (2m7) over it, lies about 3 cables westward of the southern end of Le Château-Fort (*Lat. 21° 03′ N., Long. 107° 33′ E.*).

The southern extremity of Le Château-Fort in line with Le Huron, bearing 083°.
(*Original dated* 1933.)

About 3 cables eastward of La Touffe, the channel continues in an easterly direction with the white rock on the southern end of La Touffe, astern, bearing 274°, and joins Chenal de la Surprise (page 368),



The white rock on the southern end of La Touffe, bearing 274°.
(*Original dated* 1933.)

about 1¾ miles eastward of La Touffe. Le Château-Fort and Île Plate, about 1½ cables eastward, lie on the northern side of this part of the channel; the northern end of Île de la Table with the islets lying close off it, lies on the southern side.

Vessels with local knowledge can also pass westward and northward of La Touffe, rejoining the channel between it and Le Château-Fort.

Chenal Sud.—Dangers.—Chenal Sud is only available at low water for vessels with local knowledge, drawing less than 15 feet (4m6). From a position about 2 cables north-eastward of La Souris, this channel trends in an east-north-easterly direction for about 1½ miles, thence in a north-easterly direction between La Meurtrière, La Chimère and Le Shako, on its north-western side, and the northern end of Île de la Table, on its south-eastern side.

A bank, with a depth of 17 feet (5m2) over it, in the fairway of the channel, extends southward from La Meurtrière as far as the north-western side of Île de la Table, and La Chimère is connected with the north-western side of the same island south-eastward of it by a

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Chart 3876.

bank which has a depth of 2½ fathoms (4m6) over it in the fairway of the channel.

The fairway of Chenal Sud passes north-westward of the 3-foot (0m9) shoal lying 1½ cables southward of La Touffe, and connects with Chenal Nord close south-westward of that islet.

Charts 3875, 3876.

EASTERN CHANNELS LEADING INTO THE NORTHERN PART OF ARCHIPELAGO.—Several channels lead from seaward between the islands lying on the eastern side of Archipel des Faï Tsi Long. The southernmost of these channels, leading from Baie de Quan Lan into Chenal du Lutin, is mentioned on page 348. Another channel, from the north-eastern end of Baie de Quan Lan, leads into the southern end of Chenal du Jaguar, which lies between Île de Quan Lan and Île de la Table. Pak Ha Mun (*Lat. 20° 58′ N., Long. 107° 33′ E.*), between the northern extremity of Île du Quan Lan and the southern extremity of Île Ba Mun, leads into the northern end of Chenal du Jaguar and the southern end of Chenal de la Surprise. Tsieng Mun leads into the northern end of Chenal de la Surprise and to Passe des Bruyères between the northern end of Île Ba Mun and Île aux Sangliers, about 1½ miles north-eastward. Îles Kao Tao lie off the archipelago eastward of Île Ba Mun.

Chart 3875.

Baie de Quan Lan.—Dangers.—Laï Tao, with other islands, and the dangers in the south-eastern approach to Baie de Quan Lan are described on pages 334-335. The bay is entered from south-eastward between Cap Quan Lan (page 335) and the north-eastern extremity of Fong Wong, about 3 miles west-south-westward. Île Danh Do-La (page 336) and Île Dao Trao (page 342) lie on the western side of the bay.

Baie de Quan Lan is very shallow. A bank, which dries one foot (0m3), extends about 2¼ miles north-westward from the southern end of Île de Quan Lan, and between the south-western side of this bank and Île Danh Do-La there are some patches which dry. Îlot Ouest and Îlot Est lie about 2¼ miles north-north-westward and northward, respectively, of Fong Wong. A patch, which dries 6 feet (1m8), lies about 1¾ cables from the western side of Îlot Est. Between Îlot Est and the north-eastern side of the bay there are some shoals, which dry from 3 to 6 feet (0m9 to 1m8), and Îles aux Rats are three islands lying about 2½ miles east-north-eastward of Îlot Est.

Îlot Blanc, 67 feet (20m4) high, which is a useful mark for navigating the channels leading into the bay from Passe de la Mouche (page 342) and Chenal du Lutin (page 348), is situated in the north-western part of the bay, about 8½ cables south-south-eastward of Pointe des Loutres (page 348), and close eastward of Île Dao Trao.

Chart 3876.

In the north-eastern part of the bay, Chenal du Jaguar (page 368), is entered between L'Avant-garde, an islet, lying 4½ miles northward of Cap Quan Lan and Nui Chau Dap, an island lying close off the southern end of Île de la Table, about 6½ cables westward, but there is no channel except for vessels of very shallow draught.

Charts 3875, 3876.

Île de Quan Lan.—Dangers.—Île de Quan Lan is hilly, rising

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Charts 3875, 3876.

to an elevation of 602 feet (183m5), about 2 miles north-north-eastward of Cap Quan Lan ; about 1¾ miles farther northward, on the western side of the island, is the village of Quan Lan Xa. Sommet de l'Entrée, 329 feet (100m3) high, lies at the northern extremity of the island.

Chart 3876.

Pointe Minchao (Min-tiao), the eastern extremity of the island, lies about 2¼ miles southward of its northern extremity. The eastern side of the island from a position about 2 miles northward of Cap Quan Lan (chart 3875), is fringed by reefs and a bank, with depths of less than 3 fathoms (5m5) over it, which extends 4 cables offshore in places. A detached shoal, with a depth of 29 feet (8m8) over it, lies in the approach to Pak Ha Mun, about 4¼ miles east-south-eastward of Sommet de l'Entrée (*Lat. 20° 58′ N., Long. 107° 33′ E.*) ; this shoal lies about 1¾ miles north-eastward of the outer end of a bank, with depths of less than 6 fathoms (11m0) over it, which extends west-south-westward from Îles Kao Tao (page 372).

Tidal streams.—Between Cap Quan Lan, Siong Lai Tao, Tima Tao and Fong Wong, the slack occurs shortly before high water. It then begins to run south to south-westward between Siong Lai Tao and Tima Tao, reaching its maximum rate of from one to 1½ knots, from 4 to 5 hours after high water. From 3 to 4 hours before low water it is nearly slack again and the flow turns quickly through south to north-east or north. The flow is strongest between Siong Lai Tao and Cap Quan Lan about 3 hours after low water. *See* also page 336.

Pak Ha Mun.—Dangers.—The entrance (*see* page 336) can be identified by Sommet de l'Entrée and La Bosse, a hill, 717 feet (218m5) high at the southern end of Île Ba Mun, about 9 cables north-eastward, Sommet Pak Ha Mun, 1,310 feet (399m3) high, on the northern part of Île de la Table and about 2½ miles north-north-westward of Sommet de l'Entrée, and the flat summit of Île de la Table, 1,464 feet (446m2) high, about 2½ miles west-south-westward of Sommet de l'Entrée, can also be identified. Île Ba Mun is the north-easternmost of the Archipel des Faï Tsi Long ; its summit, Le Piton, is 999 feet (304m5) high and lies about 2½ miles south-south-westward of Pointe Tsieng Mun. Within the entrance the land is high on both sides ; the eastern side is densely wooded but on the western side the slopes of the hills are clearer.

The north-eastern end of Chenal du Jaguar is situated between Sommet de l'Entrée and Le Fer à Cheval, a group of jagged rocks, about one mile north-north-westward, which is connected with Île de la Table by a narrow drying sandbank ; in this vicinity Île de la Table and Île de Quan Lan are connected by a sandbank, with depths of less than 6 feet (1m8) over it, and the navigable channel here has depths of from one to 5 feet (0m3 to 1m5). The mouth of Rivière aux Buffles, where there are some buildings, is situated about 4 cables south-westward of Le Fer à Cheval.

On the eastern side of Pak Ha Mun, Anse du Pirate, which is shallow, is entered between a point 3 cables northward of La Bosse and Pointe Ducouëdic, about 9 cables farther northward. Pointe Cormoran is situated on the western side of Pak Ha Mun, about 8 cables west-south-westward of Pointe Ducouëdic. Chenal de la Surprise is entered from southward between these two points.

The middle of Pak Ha Mun is encumbered by a narrow sandbank,

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Chart 3876.

with depths of less than 2 fathoms (3m7) over it, which extends about 1¾ miles southward from La Tortue, an islet, 90 feet (27m4) high, lying 7 cables north-westward of Pointe Ducouëdic, and leaves a narrow channel between its southern end and the eastern shore of the pass. A patch, with a depth of one fathom (1m8) over it, lies half a mile southward of La Tortue.

Anchorages.—Directions.—Vessels can anchor between Le Fer à Cheval and the sandbank which lies about 4 cables eastward, in depths of from 5½ to 6½ fathoms (10m1 to 11m9).

A more sheltered anchorage will be found eastward of the same sandbank and abreast the entrance of Anse du Pirate, where there is a muddy bottom and good holding ground, but the tidal streams are strong and the sea is rough during the North-east monsoon.

Vessels entering from seaward should steer for Sommet Pak Ha Mun, bearing 313°.

Chenal du Jaguar.—Dangers.—Chenal du Jaguar is only available for shallow draught vessels with local knowledge. La Tortue, an islet, lies on the eastern side of Chenal du Jaguar, about 3 miles south-south-westward of Sommet de l'Entrée (*Lat. 20° 58′ N., Long. 107° 33′ E.*) and about 4 cables off the south-eastern side of Île de la Table. Robinson rock, surrounded by a reef, with a similar rock about 1¼ cables east-south-eastward, lies near the middle of the channel, between La Tortue and Île de la Table. There are some islands in the south-western part of the channel, the positions of which can best be seen on the chart. A reef, with depths of from one to 17 feet (0m3 to 5m2) over it, lies nearly in mid-channel at the south-western entrance. Between Robinson rock and La Tortue the channel is very narrow and shoal; on the eastern side of the channel, about 8½ cables north-north-eastward of Robinson rock, there is a small detached drying reef.

Chenal de la Surprise.—Dangers.—The southern part of Chenal de la Surprise leads between the western side of the southern end of Île Ba Mun and the islets lying off the eastern side of the northern part of Île de la Table.

On the western side of the channel a reef extends about one cable north-north-westward from La Tortue. Le Gros Rocher, 346 feet (105m5) high, with Pain de Sucre, an islet, 172 feet (52m4) high, about 1¼ cables northward, lies midway between La Tortue and the eastern side of Île de la Table. Le Poisson-lune, an islet, 64 feet (19m5) high, lies 3 cables north-north-eastward of La Tortue. La Gourde, an islet, 152 feet (46m3) high, with La Pierre Taillée, an islet, 185 feet (56m4) high, about one cable south-westward, lies 1½ miles northward of Le Poisson-lune and about a quarter of a mile eastward of an island which lies close off the north-eastern end of Île de la Table.

A rocky shoal, which dries 8 feet (2m4), with a similar shoal, which dries 9 feet (2m7), lie about 4½ and 7 cables, respectively, southward of La Pierre Taillée and 3 cables offshore. A bank, with depths of less than 3 fathoms (5m5) over it, extends from the eastern side of Île de la Table as far as one cable eastward of the line joining Le Poisson-lune with La Pierre Taillée. La Gourde, in line with the eastern side of a remarkable cliff on Île Madeleine, bearing 002°, leads eastward of these dangers.

The above alignment should be used by vessels proceeding northward from Pak Ha Mun, from abreast Pointe Ducouëdic to abreast Le Poisson-lune.

Charts 1965, 2062, 2661a, 1263.

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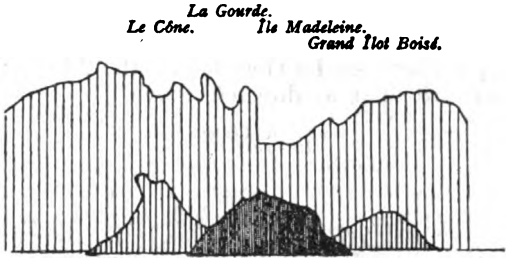
Chart 3876.



La Gourde in line with the eastern side of a remarkable cliff on Île Madeleine, bearing 002°.

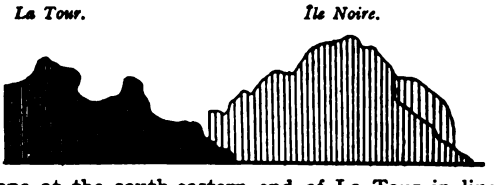
(*Original dated* 1933.)

A shoal, with a depth of 2 fathoms (2^{m}7) over it, lies less than one cable off the north-eastern side of La Gourde. The western extremity of Le Cône in line with the western extremity of Le Petit Îlot Boisé, bearing 344°, leads between this shoal and La Gourde. Le Cône is an islet, 185 feet (56^{m}4) high, lying half a mile northward of La Gourde; Le Petit Îlot Boisé lies about half a mile north-north-westward of Le Cône (*Lat. 21° 03′ N., Long. 107° 34′ E.*).

La Fourmi rock, above water, lies about one cable north-westward of La Gourde, and La Quille, a rock, 71 feet (21^{m}6) high, lies about 2½ cables farther north-westward, and about one cable off the island lying close off the north-eastern side of Île de la Table, previously mentioned.

On the eastern side of Chenal de la Surprise, Pointe aux Huitres, the northern entrance point of Anse du Nord, a shallow bay, lies nearly 2¾ miles north-north-eastward of Pointe Ducouëdic. A bank, with depths of less than 3 fathoms (5^{m}5) over it, extends 6½ cables westward from Pointe aux Huitres. Le Huron (page 364) lies about 7 cables north-north-westward of Pointe aux Huitres and about 2¾ cables from the western side of Île Ba Mun.

From abreast Le Poisson-lune to abreast La Gourde, the channel runs with the slope at the south-eastern end of La Tour, in line with the western extremity of Île Noire, bearing 013°. La Tour is an island, 444 feet (135^{m}3) high, lying on the western side of the northern portion of Chenal de la Surprise, about 1½ miles north-north-eastward of La Gourde. Île Noire lies on the same side of the channel about one mile farther north-north-eastward.



The slope at the south-eastern end of La Tour in line with the western extremity of Île Noire, bearing 013°.

(*Original dated* 1933.)

Chenal de la Surprise is joined by Chenal de la Carabine, from westward, about half a mile north-eastward of La Gourde (*see* page 365). Vessels proceeding southward from Chenal de la Carabine can pass

Charts 1965, 2062, 2661a, 1263.

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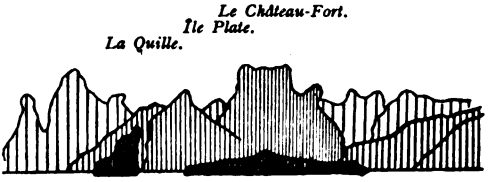
Chart 3876.

close north-eastward of La Quille by keeping the summit of Le Château-Fort in line with the summit of Île Plate (page 365), astern, bearing 304°, and can pass between La Gourde and the 2-fathom (3^m7) shoal close north-eastward of it as directed above.



The summit of Le Château-Fort in line with the summit of Île Plate, bearing 304°.

(*Original dated* 1933.)

Vessels proceeding northward from Chenal de la Carabine can alter course when the north-western extremities of La Gourde and La Pierre Taillée are in line, bearing 216°.

In the fairway of the northern part of Chenal de la Surprise there is a least depth of 19 feet (5^m8), and the depths are not less than 16 feet (4^m9) for a distance of half a cable on either side. From a position about 4 cables south-eastward of La Gourde, the channel trends in a north-north-easterly direction with the eastern extremities of Île Noire and Le Potiron, an island lying close northward, in line, bearing 016°.

La Hure (*Lat. 21° 04′ N., Long. 107° 35′ E.*), an islet, 126 feet (38^m4) high, lies on the eastern side, about half a mile northward of Le Huron and $2\frac{3}{4}$ cables from the western side of Île Ba Mun.

On the western side, a bank, with depths of less than one fathom (1^m8) over it, extends south-south-westward from La Tour nearly as far as Le Cône ; Le Grand Îlot Boisé lies on this bank, about one cable westward of La Tour. An islet, 87 feet (26^m5) high, with a white patch on its southern end, lies close northward of the north-western end of La Tour, and L'As de Trèfle, an islet, 152 feet (46^m3) high, lies $1\frac{1}{4}$ cables northward of the northern extremity of the same island.

After passing eastward of La Tour, the channel runs with the south-eastern extremity of that island in line with the eastern extremity of La Gourde, astern, bearing 204°.

On the western side of this part of the channel, Les Trois Mamelles, an islet, 536 feet (163^m4) high, with an islet about one cable off its eastern side, lies about 3 cables south-westward of Île Noire, connected to the latter by a ridge, over which there are depths of less than 6 feet (1^m8). Île Henriot lies about one cable westward of Île Noire, and Le Melon, an islet, lies close off the western side of Le Potiron.

From abreast Île Noire, the channel trends in a more easterly direction, with the southern extremity of Île Noire in line with the white patch on the southern end of the islet close northward of La Tour, astern, bearing 217°, and showing between La Tour and L'As de Trèfle.

On the south-eastern side of this part of the channel, Le Bonnet du Nord, an islet, 74 feet (22^m6) high, lies about three-quarters of a mile eastward of the northern extremity of Île Noire and 3 cables off the north-western side of Île Ba Mun. Le Bonnet du Nord is near the south-western end of a bank, over which there are depths of 3 fathoms (5^m5) or less, which extends north-north-eastward for $2\frac{1}{4}$ miles.

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Chart 3876.

Les Frères, two islets close together, the northern of which is 166 feet (50m6) high, lie on the northern end of this bank, about 6 cables west-south-westward of Pointe de Tsieng Mun, the northern extremity of Île Ba Mun. Le Coin, an islet, 218 feet (66m4) high, lies 3½ cables south-south-westward of Les Frères and about 2 cables offshore; a bank, with depths of 2¼ fathoms (4m1) over it, extends about 1¼ cables north-westward from Le Coin.

On the north-western side of this part of the channel, Les Jumeaux, an islet, 205 feet (62m5) high, lies midway between Le Potiron and Île du Doigt, 326 feet (99m4) high, about 1½ miles north-eastward. Several islets lie close north-eastward of Île du Doigt, one of which is 399 feet (121m6) high. The north-easternmost of these islets lies about one mile westward of Pointe de Tsieng Mun; Rocher Tsieng Mun, 156 feet (47m5) high, lies 3½ cables north-north-eastward of this islet.

From a position about 2 cables eastward of Île du Doigt, Chenal de la Surprise enters Tsieng Mun (page 372) between Pointe de Tsieng Mun (*Lat. 21° 08′ N., Long. 107° 37′ E.*) and Rocher Tsieng Mun with the southern extremity of Île du Doigt, astern, and in line with the north-western extremity of Les Jumeaux, bearing 236°.

The northern end of Banc Latéral, over which there is a least depth of 33 feet (10m1), lies about half a mile south-south-eastward of Pointe Tsieng and a quarter of a mile offshore. The bank extends southward for about one mile.

Anchorage.—Vessels can anchor in Chenal de la Surprise as convenient; the bottom consists of mud and the holding ground is good. During the North-east monsoon the sea is rough.

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CHAPTER VIII

TONGKING GULF—NORTHERN AND NORTH-EASTERN SIDES—HAINAN STRAIT—HAINAN ISLAND

Chart 3876.

TSIENG MUN AND APPROACH.—Îles Kao Tao.—Dangers.—Îles Kao Tao are situated in the approach to Tsieng Mun, from 7 to 14 miles offshore; Ma Chao, the north-easternmost of the group, lies about 12½ miles east-north-eastward of Pointe de Tsieng Mun. The islands are nearly bare of trees, the larger ones being cultivated, and form a contrast with the islands near Cap Quan Lan, which are densely wooded. The spaces between the islands are encumbered with dangers, the positions and extent of which can best be seen on the chart. No vessel should navigate between the islands without local knowledge.

Île Tching Lan Xan, the south-easternmost of the Îles Kao Tao, 650 feet (198m1) high, has a range of hills running along its centre, terminating, at the southern end of the island, in red cliffs. Some islets and rocks lie off the northern end of the island; the outermost of these are Xan Chao (*Lat. 21° 03′ N., Long. 107° 52′ E.*), an islet, 225 feet (68m6) high, about half a mile off the north-eastern end, and a rock, which dries 3 feet (0m9), about one mile northward of the north-western end. Cap Chao Chay, an islet, 212 feet (64m6) high, lies about three-quarters of a mile south-westward of the north-western extremity of Île Tching Lan Xan, and is fringed by a bank, with depths of 11 feet (3m4) over it, extending about 7 cables west-north-westward from its north-western side.

Tang Mun Chao, an islet, 130 feet (39m6) high, lies about 2 cables north-westward of the south-western end of Île Tching Lan Xan. A rock, with a depth of 4 feet (1m2) over it, lies nearly one mile north-north-westward of Tang Mun Chao; depths of 3 fathoms (5m5), or less, extend about one mile northward and 4 cables southward from the rock. Another rock, with a depth of less than 6 feet (1m8) over it, lies about 2 cables westward of the northern extremity of Tang Mun Chao.

Sha Pak Wan, an island with a conical summit, 553 feet (168m6) high, near its northern end, lies about one mile westward of the southern extremity of Île Tching Lan Xan. Tai Cong, an inlet which dries, and which is entered on the eastern side, is separated from a bay on the south-western side of the island by a low narrow neck of land; there is a flagstaff on the 225-foot (68m6) summit, on the southern side of Tai Cong. Ngao Pi Long, an islet, 156 feet (47m5) high, lies on a reef which extends about three-quarters of a mile from the eastern

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Chart 3876.

side of Sha Pak Wan. A shoal, with a depth of 14 feet (4m3) over it, lies about 4½ cables east-south-eastward of Ngao Pi Long. A reef, which dries one foot (0m3), extends half a mile from the north-eastern side of Sha Pak Wan, and a bank, with depths of less than 3 fathoms (5m5) over it, extends as much as 2½ miles from the same side.

A spit, with depths of less than 5 fathoms (9m1) over it, extends about half a mile from the south-western extremity of Sha Pak Wan. A bank, with depths of less than 3 fathoms (5m5) over it, extends about 1½ miles from the south-western side of the island; a rock, which dries 3 feet (0m9), lies on the outer edge of this bank, about 2 miles north-north-westward of the south-western extremity of the island, and a detached 3-fathom (5m5) patch lies about 1½ miles westward of the rock. A rocky shoal, with a least depth of 7 feet (2m1) over it, lies three-quarters of a mile westward of the western extremity of the island, and a bank, with depths of less than 5 fathoms (9m1) over it, extends about 3 miles farther westward. The detached 29-foot (8m8) shoal, lying 6¼ miles westward of the south-western extremity of Sha Pak Wan, has been mentioned on page 367.

Rocher Ulipaï, 3 feet (0m9) high, lies about 2¾ miles north-westward of the northern extremity of Sha Pak Wan. A rock, which dries 8 feet (2m4), lies 3 cables northward, and another rock, which dries 6 feet (1m8), lies about 2 cables southward, of Rocher Ulipaï. Roche du Pou, with a depth of 15 feet (4m6) over it, lies about 1¼ miles north-westward of Rocher Ulipaï.

Cao Thao Chay (*Lat. 21° 02′ N., Long. 107° 46′ E.*), an island, 336 feet (102m4) high, lies about one mile north-eastward of the northern extremity of Sha Pak Wan. Xai Ly Nhy, an islet, lies on a bank, with depths of less than 3 fathoms (5m5) over it, about 6 cables north-westward of Cao Thao Chay. Patches of reef, which dry, extend 7 cables southward and 2 cables northward from Xai Ly Nhy. Roche du Chinois, with a depth of 9 feet (2m7) over it, lies about 1¼ miles westward of Xai Ly Nhy, with several drying patches between. A rock, with a depth of 17 feet (5m2) over it, lies about half a mile north-north-westward of Roche du Chinois. Plateau du Nord-ouest, a rocky shoal, with a least depth of 3 fathoms (5m5) over it, lies 2 miles west-north-westward of Xai Ly Nhy. A shoal, with a depth of 26 feet (7m9) over it, lies half a mile north-westward of the shoalest part of Plateau du Nord-ouest, and a bank, with depths of 6 fathoms (11m0) or less over it, extends about 1¼ miles north-north-eastward.

Tai Ly Nhy, an islet, 208 feet (63m4) high, lies about one mile northward of Cao Thao Chay, with foul ground, portions of which dry, between. A bank, with depths of 3 fathoms (5m5) or less over it, extends about 1½ miles westward, one mile north-westward and 3 cables north-eastward from Tai Ly Nhy.

A rock, which dries 3 feet (0m9), and another, with a depth of less than 6 feet (1m8) over it, lie near the north-western edge of this bank about one mile north-westward of Tai Ly Nhy. La Souris, a detached rock, which dries 8 feet (2m4), lies about 1½ miles west-north-westward of the southern extremity of Tai Ly Nhy; a rock, which dries, and another, with a depth of less than 6 feet (1m8) over it, lie about 2 cables east-south-eastward of La Souris; and a detached rocky patch, with a depth of 15 feet (4m6) over it, lies about one mile north-north-westward of the north-western extremity of Tai Ly Nhy.

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Chart 3876.

Toc Xec Chao, an islet, 38 feet (11m6) high, fringed by a reef and by a bank, parts of which dry, extending about 4½ cables west-north-westward, lies 2½ miles eastward of Tai Ly Nhy. A detached rocky shoal, with a least depth of one foot (0m3) over it, lies about 1¾ miles north-eastward of Toc Xec Chao.

Vang Chao, an island, 310 feet (94m5) high, lies about 2 miles northward of Toc Xec Chao. Ca Pui Chao, an islet fringed by a narrow reef, lies about half a mile south-eastward of Vang Chao. A bank, with depths of 6 fathoms (11m0) or less over it, extends about 2½ miles westward and 2 miles north-westward from Vang-Chao; Tai Tsieng Tan, a high rock, lies on this bank about 1¾ miles westward of the south-western extremity of Vang Chao; a spit, with a depth of 29 feet (8m8) over it, extends about 2 cables southward from the rock. Txat Xing Chao is the largest of a group of islets, connected by reefs which dry, lying about 1¼ miles north-westward of Vang Chao. A reef, on which are some islets, extends about 4 cables north-north-eastward from Txat Xing Chao.

Ma Chao (*Lat. 21° 09′ N., Long. 107° 51′ E.*), 297 feet (90m5) high, with a reef, on which are some islets, extending half a mile from its north-eastern end, lies about 3¼ miles north-eastward of Txat Xing Chao. A bank, with depths of 6 fathoms (11m0) or less over it, extends about 1½ miles south-westward and southward from Ma Chao. Ma Chao Chay, an islet, 90 feet (27m4) high, lies on the bank extending south-westward from Ma Chao. Phan Xi Chao, an island, 244 feet (74m4) high, lies about 3½ cables southward of Ma Chao Chay. Toi Mui Chao, an islet, 132 feet (40m2) high, lies half a mile south-eastward of Phan Xi Chao, with an islet and foul ground between. A reef, with a depth of one foot (0m3) over it, extends about 2 cables east-north-eastward from Toi Mui Chao. Chim Xan, with a conical summit, 467 feet (142m3) high, lies 5½ cables south-eastward of Ma Chao. A spit, with a depth of 16 feet (4m9) at its outer end, extends about 3½ cables south-south-westward from Chim Xan.

Anchorage.—There is anchorage for vessels with local knowledge, with a draught of about 15 feet (4m6), between Sha Pak Wan and Île Tching Lan Xan. The anchorage is open to southerly winds.

Dangers between Îles Kao Tao and Tsieng Mun.—Banc Intermédiaire, with a least depth of 10 feet (3m0) over it, lies about midway between Rocher Ulipaï (page 373) and Île Ba Mun. Roche Nam, with a depth of 2 fathoms (3m7) over it, lies at the north-eastern end of this bank and 3¾ miles east-south-eastward of Pointe de Tsieng Mun. A rocky patch, with a depth of 23 feet (7m0) over it, lies about 3 cables south-eastward of Roche Nam. Roche du Nhatrang, with a depth of 9 feet (2m7) over it, lies about 2 miles south-eastward of the same point; a bank, with depths of less than 5 fathoms (9m1) over it, extends about 2 miles southward from this rock. Roche du Hugon, with a depth of 6 feet (1m8) over it, lies about 2 miles east-north-eastward of Pointe de Tsieng Mun. Rocher Tsieng, bearing more than 276° and open southward of Île Boisée, leads southward of Roche du Hugon. The two last-mentioned dangers are shoal heads on an extensive bank, over which there are depths of from 4 to 6 fathoms (7m3 to 11m0), and which lies in the approach to Tsieng Mun; the eastern edge of this bank lies about 3½ miles from the entrance.

Banc Latéral, in the southern approach to Tsieng Mun, is described on page 371.

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Chart 3876.

Tsieng Mun.—Anchorage.—Tsieng Mun is entered between Pointe de Tsieng Mun, and Île Boisée, 8 cables north-eastward. This pass leads to Passe des Bruyères and the northern end of the channels running through the eastern portion of Archipel des Faï Tsi Long. A spit, with a depth of 9 feet (2m7) over it, extends about one cable north-eastward from Pointe de Tsieng Mun, and a bank, with depths of less than 5 fathoms (9m1) over it, extends about half a mile south-eastward from the southern extremity of Île Boisée.

A short distance within the entrance of Tsieng Mun there is excellent shelter, in depths of from 8 to 10 fathoms (14m6 to 18m3), with good holding ground. Shallow draught vessels will find better shelter in Chenal de la Surprise (page 368).

Tidal streams.—On either side of Île aux Sangliers the flow sets north-eastward on the rising tide and south-westward on the falling, and attains a rate of from one to 1½ knots with large tides.

Petite Passe Tsieng Mun.—Petite Passe Tsieng Mun is entered from southward between Île Boisée and the southern end of Île aux Sangliers, about 2¾ cables eastward. This pass is unimportant and leads to a channel about one cable wide, in its narrowest part, running northward close off the western side of Île aux Sangliers. A reef extends about one cable north-eastward from the northern extremity of Île Boisée and another reef extends 1¾ cables south-south-westward from a point situated on the south-western side of Île aux Sangliers about half a mile within the entrance of the pass.

Passe des Bruyères.—From a position 5 cables north-north-westward of Pointe de Tsieng Mun (*Lat. 21° 07′ N., Long. 107° 38′ E.*), Passe des Bruyères trends west-north-westward, and after passing northward of Rocher Tsieng Mun, takes a more northerly direction for one mile, with the northern extremity of that rock in line, astern, with a white pyramidal structure on the north-western end of Île Ba Mun, bearing 132°. The channel then takes a still more northerly direction and passes 1¼ cables north-eastward of the reef extending from the north-eastern end of Île aux Bruyères (page 357), and between that island and the south-western side of an extensive bank which lies southward of Île Longue (page 357); there are depths of less than 3 feet (0m9) on the southern and south-western sides of this bank, and here the channel is less than 2 cables wide. A white mark on the northern extremity of the north-easternmost of the islets lying close north-eastward of Île du Doigt (page 371), in line, astern, with a pyramidal structure standing on the southern islet of Les Frères (page 371), bearing 148°, leads between Île aux Bruyères and the bank, and into Chenal du Duchaffaut (page 355).

Vessels are recommended not to anchor in the western part of Passe des Bruyères, as the swell from seaward is often felt there. If necessary vessels should use the anchorage between Île aux Bambous and Île de Ké Bao (page 357).

Charts 3876, 3877.

COAST.—From the northern extremity of Île de Ké Bao to Cap Pak Loung, about 38 miles north-eastward, hills, covered with trees and dense jungle, extend to the coast, which is bordered by mangroves, and through which some unimportant rivers discharge into the gulf. Inland there are mountains, from 4,000 to 5,000 feet (1,219m2 to

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Charts 3876, 3877.

1,524^{m}0) high, only visible in clear weather. Long and narrow islands lie a short distance off, and parallel with the coast; within these islands are channels affording well sheltered anchorages to vessels with local knowledge. Lo Chuc San and other islands lie off this stretch of coast.

Tidal and tidal streams.—The range of the tide increases gradually between Presqu'île de Do Son and Cap Pak Loung.

The tidal streams are stronger off this part of the coast than in the Archipel des Faï Tsi Long, especially in the channels. Slack water coincides with high and low water, except off Ké Bao, where the tidal stream begins to run in a north-easterly direction about 4 hours before low water and in a south-easterly direction from 3 to 4 hours after low water.

Off-lying islands and dangers.—The Lo Chuc San group of three islands and several rocks lies about 6 miles north-eastward of Îles Kao Tao.

Lo Chuc San, the principal island of the group, has several peaks, the highest of which has an elevation of 611 feet (186^{m}2). The island is inhabited by Chinese and fishermen from Pakhoi seek shelter there at night. Ledges of rock, some of which dry, extend about 6 cables from the eastern side of the island. A bank, on which there are some dangers, extends 1½ miles eastward and 1½ miles south-eastward from the island, with depths of 6 fathoms (11^{m}0) over it or less. A 14-foot (4^{m}3) patch and a 16-foot (4^{m}9) patch lie on this bank, about 1½ miles east-south-eastward and 1½ miles eastward, respectively, of the south-eastern extremity of the island. Banc du Pluvier, which dries 3 feet (0^{m}9), lies about 8 cables north-eastward of the same point. A detached rocky patch, with a depth of 33 feet (10^{m}1) over it, lies about 1½ miles eastward of Banc du Pluvier.

La Pyramide, a rock, 57 feet (17^{m}4) high, lies close off the northern extremity of Lo Chuc San (*Lat. 21° 14′ N., Long. 107° 58′ E.*). A rock, with a depth of 3 feet (0^{m}9) over it, lies about 5 cables east-north-eastward of La Pyramide, with a reef, which dries about 5 feet (1^{m}5), nearly midway between. A number of dangers, with depths of less than 5 fathoms (9^{m}1) over them, lie off the north-western side of the island and extend nearly one mile; the positions of these can best be seen on the chart.

Chart 3877.

Im Shan, an island, 195 feet (59^{m}4) high, lies about 2½ miles south-eastward of Lo Chuc San. An islet, 136 feet (41^{m}4) high, lies close off the western extremity of Im Shan, and two rocks, the north-eastern of which has an elevation of 15 feet (4^{m}6), lie close off its southern extremity. A bank, with depths of 6 fathoms (11^{m}0) or less over it, extends about 8 cables westward from the island, and foul ground extends about 2 cables south-westward. A reef, which dries 11 feet (3^{m}4), lies about 3½ cables eastward of the southern extremity of the island, and a group of rocks, 16 feet (4^{m}9) high, lies about 2 cables farther eastward, with a 16-foot (4^{m}9) patch close north-eastward of it. A rocky shoal, with a depth of 23 feet (7^{m}0) over it, lies about 3 cables eastward of the north-eastern extremity of the island, and there is a bank, with a depth of 10 feet (3^{m}0) over it, extending about one cable north-westward from the north-western extremity.

Tai Shan Tao, 441 feet (134^{m}4) high, the south-easternmost island

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Chart 3877.

of the group, lies about 4 cables south-south-eastward of Im Shan. A rock, over which there is a depth of 27 feet (8m2), lies in the channel between the two islands, nearly 2 cables west-north-westward of the northern extremity of Tai Shan Tao. A rock, 37 feet (11m3) high, and a rock, with a depth of 5 feet (1m5) over it, lie close off the western extremity of Tai Shan Tao. Rocher Occidental, 15 feet (4m6) high, lies about half a mile west-north-westward of the same point.

Sam Ha Paï is a reef with two heads, which dry one foot (0m3) and 3 feet (0m9), lying about 5½ miles east-north-eastward of the northern extremity of Lo Chuc San. Rocher Occidental, bearing 208°, and open north-westward of the 136-foot (41m4) high islet lying close off the western extremity of Im Shan, leads north-westward of Sam Ha Paï.

Pak Son Kong Paï, a dangerous rock, one foot (0m3) high, with a reef, which dries 4 feet (1m2), close westward of it, lies about 10 miles north-eastward of Sam Ha Paï. A rocky shoal (chart 2062), with a depth of 6 feet (1m8) over it, lies about one mile north-eastward of Pak Son Kong Paï, and there is a rocky shoal, with a depth of 20 feet (6m1) over it, about one mile westward of the same rock.

Charts 3876, 3877.

Anchorage.—There is anchorage, affording good shelter during the North-east monsoon, about half a mile south-eastward of the western extremity of Lo Chuc San and 2 cables offshore, in a depth of about 5½ fathoms (10m1), mud and sand.

Approaches to Port Wallut and Tien Yen.—Dangers.— North-westward of Îles Kao Tao (page 372), and westward of Lo Chuc San, is Kuai Chin Mun, which leads, between the islands lying close off the coast, to Port Wallut and Tien Yen, through Cua Mo. Depths of 6 fathoms (11m0) or less extend about 6 miles off the islands situated in the approach and, within depths of 5 fathoms (9m1), there are numerous shoals, with depths of from 4 to 18 feet (1m2 to 5m5) over them.

Île aux Sangliers, 651 feet (198m4) high, the southern extremity of which is mentioned on page 375, lies on the southern side of the approach. Le Grand Banc, over which there is a least depth of 2 fathoms (3m7), lies with its western edge about one mile eastward of the northern half of Île aux Sangliers. Le Petit Banc (*Lat. 21° 12′ N., Long. 107° 45′ E.*), a rocky shoal, with two heads about 6 cables apart, over which there are depths of 7 feet (2m1), lies about 4 miles east-south-eastward of the northern end of Île aux Sangliers.

Île aux Singes, on the southern side of the approach, is separated from the northern end of Île aux Sangliers by Petite Passe Kuai Chin, about a quarter of a mile wide. A reef, which dries 8 feet (2m4), and rocks, with depths of less than 6 feet (1m8) over them, extend about 2 cables north-eastward from the northern end of Île aux Singes. Le Banc du Milieu, a sandbank, with a least depth of 4 feet (1m2) over it, lies about 4½ miles eastward of Île aux Singes ; it is situated on the south-eastern edge of an extensive bank, with depths of 3 fathoms (5m5) and less over it, which extends about 4½ miles north-westward.

Chart 3877.

On the northern side of the approach, Île du Kersaint lies with its western end about 8 miles north-westward of Lo Chuc San. Between Tsieng mui tao, the eastern extremity of Île du Kersaint, and Tim san, a hill on the southern end of a peninsula about 4 miles south-westward, there is a bight in the south-eastern side of the island.

Charts 1965, 2062, 2661a, 1263.

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Chart 3877.

About half a mile off the shore of this bight, there are patches, with depths of 3, 7, and 9 feet (0m9, 2m1, and 2m7) over them, respectively, lying about 1½, 2, and 2¾ miles north-eastward of Tim san; the position of the first of these patches is doubtful, and the last consists of rock.

A bank, with depths of less than 5 fathoms (9m1) over it, extends about 2 miles from this part of Île du Kersaint. A rocky patch, with a depth of 26 feet (7m9) over it, lies about 2½ miles southward of Tsieng mui tao. A detached shoal, with a depth of 29 feet (8m8) over it, lies about 4 miles east-south-eastward of Tsieng mui tao. A detached shoal, with a depth of 5 fathoms (9m1) over it, lies about 5 miles south-eastward of Tsieng mui tao. An extensive bank of sand and mud, with a least depth of 27 feet (8m2) over it, lies about 3 miles south-south-eastward of Tim san.

A bank, with depths of 3 fathoms (5m5) over it, or less, and a least depth of 10 feet (3m0), extends about 3 miles south-south-eastward, and then 2 miles south-westward, from a position about one mile south-eastward of the south-western extremity of Île du Kersaint.

Fu Tai Mun, entered between the south-western extremity of Île du Kersaint and the north-eastern end of Île du Château Renaud, about 1½ miles north-westward, is described on page 382.

A wooded islet, with drying reefs lying about half a mile eastward and north-eastward of it, lies about 2¼ miles south-south-westward of the north-eastern end of Île du Château-Renaud and about one mile offshore.

Charts 3876, 3877.

Tsin San is an island lying with its eastern end on the outer edge of a bank, with depths of 3 fathoms (5m5) over it and less, which extends about 2 miles from the south-eastern side of Île du Château Renaud. A spit, with depths of less than 6 feet (1m8) over it, with a reef, which dries one foot (0m3) at the outer end, extends about 2 cables northward from the eastern end of Tsin San; a bank, with similar depths, extends about 6 cables north-westward from the western end of the island.

Banc de la Clocheterie (*Lat. 21° 16′ N., Long. 107° 49′ E.*), with a least depth of 10 feet (3m0) over it, lies about 2½ miles south-south-eastward of the eastern end of Tsin San. A bank, with depths of 3 fathoms (5m5) or less over it, extends about 2 miles south-eastward from the southern side of Tsin San and then spreads eastward, southward and westward, the eastern part forming Banc de la Clocheterie; Le Banc du Milieu lies on the eastern edge of the southern part.

Kai Tio Mun, about 1½ cables wide between the south-western end of Île du Château Renaud and the north-eastern end of Île du Grand Singe, is described on page 382. Roche de l'Huitre, which dries 2 feet (0m6), lies in the approach to Kai Tio Mun about one mile south-eastward of the south-western extremity of Île du Château Renaud.

Îlot Conique, with a reef extending about 2 cables north-eastward from its northern end, on which is Îlot Pipe, lies 1¼ miles southward of the north-eastern extremity of Île du Grand Singe. A rock, which dries 9 feet (2m7), and another, which dries 10 feet (3m0), lie about 2½ cables northward and 1½ cables westward, respectively, of the northern end of Îlot Conique. Île aux Cigales lies 1½ miles south-westward of Îlot Conique, with an island and some reefs between them. A ridge, with depths of 3 fathoms (5m5) or less over it, extends about

Charts 1965, 2062, 2661a, 1263.

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Charts 3876, 3877.

half a mile eastward from the southern extremity of Île aux Cigales. The islets and dangers between Îlot Conique and Île aux Cigales are joined to the south-eastern side of Île du Grand Singe by a narrow bank, with depths of less than 3 fathoms (5m5) over it.

Kuai Chin Mun is entered between Île aux Cigales and Île aux Singes. A rocky bank, with depths of from 3 to 18 feet (0m9 to 5m5) over it, extends about 8 cables from the western side of Île aux Singes. A detached patch, with a depth of 19 feet (5m8) over it, and a rocky patch, with a depth of 17 feet (5m2) over it, lie about one mile and 1¾ miles, respectively, westward of the north-eastern extremity of Île aux Singes.

Ko Kai Mun, entered between the south-western end of Île du Grand Singe and the north-eastern end of Île des Deux Chaines, about 6 cables south-westward, is described on page 381.

Île de la Plage, 274 feet (83m5) high, lies about one mile southward of the north-eastern extremity of Île des Deux Chaines; the channel between these two islands is navigable by shallow draught vessels with local knowledge. A bank, on which is a rock, which dries 6 feet (1m8), extends about one mile south-westward from the south-western end of Île de la Plage. Île Verte, with a rock, 9 feet (2m7) high, close off its north-eastern end, lies on the south-western edge of this bank. There is a depth of 14 feet (4m3) on the southern edge of the bank, about 3½ cables south-eastward of Île Verte.

Cua Mo.—Dangers.—Cua Mo is entered between Île Verte (*Lat. 21° 15′ N., Long. 107° 37′ E.*) and the north-eastern extremity of Île Ké Bao (page 357), and leads to Port Wallut and Tien Yen. On the northern side, Île des Amis lies about three-quarters of a mile westward of Île Verte. Île des Pirates lies on the southern side, about half a mile southward of Île des Amis and separated from Île Ké Bao by a channel, less than 2 cables wide, which is navigable by small vessels with local knowledge. A Customs station and a flagstaff are situated on the south-western extremity of Île des Pirates. Port Wallut, a small indentation in the coast of Île Ké Bao, is entered about 2 cables south-eastward of the south-western end of Île des Pirates. Between Port Wallut and a point about 2½ miles north-westward there is a shallow bight in the north-eastern side of Île Ké Bao.

A shoal, with a depth of 23 feet (7m0) over it, lies 3 cables south-westward of Île Verte. A bank, with depths of from one to 9 feet (0m3 to 2m7) over it, extends about 3 cables eastward from Île des Amis. Sandbanks, which dry, and on which fishing stakes are frequently erected, lie northward and westward of Île des Amis. A bank, with depths of from 5 to 18 feet (1m5 to 5m5) over it, lies between the sandbank lying close westward of Île des Amis and the south-western end of Île des Pirates. Near the southern edge of the bank, about 3 cables northward of the latter point, there is a depth of 14 feet (4m3).

A shoal, with a depth of 8 feet (2m4) over it, lies nearly in the middle of the channel between Île des Pirates and Île Ké Bao, about 6 cables eastward of the south-western extremity of Île des Pirates. A rock, one foot (0m3) high, and surrounded by a drying reef, lies about 7 cables south-westward of the south-western extremity of Île des Pirates, and about 1½ cables from the coast of Île Ké Bao; a 26-foot (7m9) patch lies about 2 cables north-north-eastward of this rock.

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Port Wallut.—Pilotage.—Coal from Île Ké Bao is exported from Port Wallut. Vessels proceeding to the port should pass northward and westward of Île des Pirates. Pilotage is not compulsory. Vessels requiring pilots for entering can obtain them from Hongay by applying in advance, or from Cam Pha when leaving.

Port facilities.—There is a coaling wharf, about 180 feet (54m9) long, with a depth of 26 feet (7m9) alongside. There is a crane, with a lifting capacity of 5 tons, on the wharf. During the ebb stream an eddy is experienced at the wharf.

Small repairs can be executed.

Fresh provisions can be obtained in small quantities.

Communication.—There is regular steamer communication with Hongay, Haïphong and Mon-Cay.

Port Wallut is connected to the general telegraph system.

Chart 3876.

Rade de Tien Yen.—Dangers.—Lights.—Pointe du Coq, the northern extremity of Île Ké Bao, lies about 7 miles north-westward of the south-western extremity of Île des Pirates. Rade de Tien Yen lies between the north-eastern side of Île Ké Bao and drying sandbanks on the north-eastern side of the channel which is about half a mile wide.

The channel which leads from Tien Yen to Cam Pha (page 362) is entered from eastward between Pointe du Coq and Pointe Pagode, on the mainland, about 6½ cables north-westward. The mouth of Song Tien Yen is situated between Pointe Pagode and a point on the mainland about three-quarters of a mile north-eastward. Chenal de la Bourrasque, which is shallow, leads eastward from the mouth of Song Tien Yen, between the mainland and some islands lying a short distance off it, to Ko Kai Mun. The western approach to Chenal de la Bourrasque is barred by a shoal, which dries about 7 feet (2m1).

The north-western part of Rade de Tien Yen is encumbered with several detached shoals, with depths of from 6 to 16 feet (1m8 to 4m9) over them, and a rocky bank, parts of which dry, extends about one mile south-eastward from Pointe Pagode. Vessels without local knowledge should not proceed above Port Wallut.

A light is exhibited, at an elevation of 23 feet (7m0), from a white tower with red bands, on Pointe Pagode.

A light is exhibited, at an elevation of 10 feet (3m0), from a white tower with red bands, on the rocky bank, about 8 cables south-eastward of Pointe Pagode (*Lat. 21° 17′ N., Long. 107° 27′ E.*).

Anchorages.—There is anchorage from a half to one mile westward of the south-western extremity of Île des Pirates, in depths of from 4 to 6½ fathoms (7m3 to 11m9), good holding ground. Farther north-westward, towards the mouth of Song Tien Yen, swinging room for large vessels is restricted by the rocky shoals already mentioned.

There is anchorage for small vessels with local knowledge off Pointe Pagode.

Anchorage in the channel between Île des Pirates and Île Ké Bao is restricted to vessels of about 150 feet (45m7) in length and is not recommended on account of the strength of the tidal streams and the violence of the squalls from the mountains.

Tidal streams.—In the channel between Île des Pirates and

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Chart 3876.

Île Ké Bao the streams attain a rate of from 2 to 2½ knots and westward of the former island they reach 1½ knots.

Tien Yen.—Tien Yen (chart 1965) is situated about 4 miles north-westward of Pointe Pagode. Song Tien Yen is only a torrent; during the dry season it is barely accessible for boats and during the rainy season the current runs so strongly that even steamboats have difficulty in ascending.

A few fresh provisions are obtainable.

There is regular steamer communication with Haïphong and Mon-Cay. Tien Yen is connected to the general telegraph system.

Charts 3876, 3877.

Ko Kai Mun.—Dangers.—The entrance to Ko Kai Mun is described on page 379. There are depths of from 7 to 11 fathoms (12m8 to 20m1) in the pass, but not more than 3 fathoms (5m5) in the approach from seaward.

On the southern side of the approach, a bank, with a depth of 2 fathoms (3m7) at its outer end, extends three-quarters of a mile north-eastward from Île de la Plage. A ridge of rocks, one foot (0m3) high, surrounded by foul ground, lies near the fairway about 3 cables southward of the eastern entrance point. A ridge of rocks, one foot (0m3) high, lies near the fairway about 3 cables southward of the eastern entrance point. An island with a bare summit, 317 feet (96m6) high, lies on the northern side of the pass, a quarter of a mile within the entrance; two rocks, about one cable apart, the northern with a depth of 3 feet (0m9) over it, and the southern with a depth of 4 feet (1m2) over it, lie near the middle of the fairway, within the entrance, about 3 cables west-south-westward of the south-western extremity of this island. The ridge of rocks, one foot (0m3) high, outside the entrance, in line with the southern extremity of Île aux Cigales (*Lat. 21° 16′ N., Long. 107° 40′ E.*) (page 378), bearing 101°, leads close southward of these dangers.

Leading mark.

The southern extremity of Île aux Cigales bearing 101°, in line with ridge of rocks.

(*Original dated* 1933.)

A rock, with a depth of 17 feet (5m2) over it, and another, which dries 6 feet (1m8), lie about one cable north-westward and north-eastward, respectively, of the western extremity of the 317-foot (96m6) island, and a 20-foot (6m1) patch lies about one cable north-north-westward of the northern extremity of the same island; a rock, which dries 7 feet (2m1), lies in the fairway at the northern end of the narrow channel separating the same island from Île des Petits Bois, close north-eastward. Île du Tir, with an islet about half a mile north-eastward, lies about 1½ miles west-north-westward of the same island near the outer edge of a drying bank which extends off the mainland. Chenal de la Bourrasque (page 380) is entered southward of Île du Tir.

Damha, an important village, which is connected to the general telegraph system, is situated on the western bank of a river about

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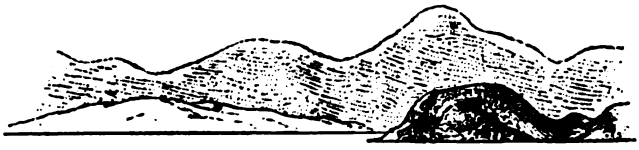
Charts 3876, 3877.

3½ miles northward of Île du Tir. Boats can ascend the river to within a short distance of the village.

Directions.—After passing through Kuai Chin Mun, a vessel should approach Ko Kai Mun with the south-western extremity of the island, 317 feet (96m6) high, in line with the south-western slope of a distant hill, bearing 320°.



Leading mark.

The south-western extremity of the island, 317 feet (96m6) high, in line with the south-western slope of a distant hill, bearing 320°.

(*Original dated* 1886.)

After passing the ridge of rocks outside the entrance, the ridge should be kept astern in line with the southern extremity of Île aux Cigales, bearing 101°, until the rocks lying a short distance within the entrance are passed.

Kai Tio Mun.—Dangers.—There are depths of 8 fathoms (14m6) in Kai Tio Mun, but not more than 3 fathoms (5m5) in the approach from seaward. For Roche de l'Huitre, lying in the approach, *see* page 378.

Within the pass, the depths decrease rapidly to less than 5 fathoms (9m1). A shoal, with a depth of 4 feet (1m2) over it, lies about half a mile west-north-westward of the north-eastern extremity of Île du Grand Singe (*Lat. 21° 17′ N., Long. 107° 40′ E.*).

Fu Tai Mun.—Dangers.—The entrance to Fu Tai Mun is described on page 378. There are depths of 9 fathoms (16m5) in the pass, but only 3½ fathoms (6m4) in the approach over the coastal bank. Banc de la Clocheterie, with the bank lying eastward of it, which lies on the south-western side of the approach, is described on page 378.

Chart 3877.

The shoals south-south-eastward of the south-western end of Île du Kersaint, which lie on the north-eastern side of the approach, are described on page 378. A shoal, with a least depth of 10 feet (3m0) over it, lies on the western side of the entrance, from 3 to 11 cables southward of the north-eastern extremity of Île du Château-Renaud.

On the eastern side of the pass, the western end of Île du Kersaint consists of two peninsulas, the extremities of which are about one mile apart; Sommet A, 517 feet (157m6) high, lies near the extremity of the southern peninsula. A drying bank extends from the north-western side of the southern peninsula almost as far as the northern peninsula. A rock, above water, lies 1½ cables south-eastward of the western extremity of the northern peninsula. Fu Tai Mun is 7 cables wide between the last-mentioned extremity and the north-eastern end of Île du Château-Renaud; a rocky shoal, with a least depth of 16 feet (4m9) over it, lies in the middle of the pass, about half a mile westward of the western extremity of Île du Kersaint.

Within the pass are several prominent wooded islets. Chapeau Chinois, 609 feet (185m6) high, lies 3 miles westward of the northern extremity of Île du Château-Renaud. A bank, with depths of from

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Chart 3877.

one to 3 fathoms (1m8 to 5m5) over it, extends 2½ miles eastward from Chapeau Chinois. Îlot des Mages, a group of islets, lie 8 cables north-north-eastward of Chapeau Chinois; a rock, which dries 6 feet (1m8), lies about 1¼ miles north-eastward of Îlot des Mages. Les Myrmidons, a bare hill, 261 feet (79m5) high, rising above the mangroves on the coast of the mainland, lies about 1½ miles north-north-westward of Îlot des Mages. Drying banks and shoals, on which are fishing stakes, extend offshore in this locality for a considerable distance; the extent of these can best be seen on the chart. Île Verte lies about 2¾ miles northward of the western extremity of Île du Kersaint. A bank, most of which dries, extends southward from Île Verte almost as far as the northern side of Île du Kersaint; a rock, with a depth of 13 feet (4m0) over it, lies about one mile north-north-westward of the north-western extremity of Île du Kersaint and on the western edge of this bank; this rock lies on the eastern side of the entrance to a channel, about 3 cables wide, which trends north-north-eastward past the western side of Île Verte and between the banks extending from the mainland. A short distance farther westward there is a narrow channel leading towards Ha Coi, a town, situated on the mainland about 4¾ miles north-westward of Île Verte (*Lat. 21° 25′ N., Long. 107° 50′ E.*). This town is the most populous in the northern part of the Tongking gulf. The inhabitants are mostly Chinese. Approach to the town can only be made in boats with local knowledge.

Tidal streams.—The tidal streams in Fu Tai Mun are strong. The ebb stream maintains a rate of 3 knots for about 3 hours.

Slack water after the flood stream occurs at the same time as high water at Pakhoi. Slack water after the ebb stream occurs one hour before low water at that place.

Anchorage.—Directions.—A vessel entering should steer for the western extremity of Île du Kersaint, bearing 349°, and when 4 cables off that point, she should alter course to pass about 2 cables south-westward of it, and between it and the 16-foot (4m9) shoal lying half a mile westward. Having passed north-eastward of this shoal, course should be altered for Les Myrmidons, with Sommet A astern and well open south-westward of the western extremity of Île du Kersaint. The vessel can then anchor as convenient.

Small vessels with local knowledge can anchor off the western side of Île Verte, in a depth of 4 fathoms (7m3).

Inshore channels.—There is an inner channel, in which there is a depth of not less than 2 fathoms (3m7), connecting Ko Kai Mun, Kai Tio Mun and Fu Tai Mun. This channel runs along the north-western sides of the islands separating these passes at a distance of about one cable; the shoals between the passes consist of mud.

There is a channel along the northern side of Île du Kersaint, connecting Fu Tai Mun with Kua Tam (page 384). There is a depth of not less than 17 feet (5m2) in the fairway of this channel, but the fairway is narrow in places and varies in its distance from Île du Kersaint. The northern side of the channel consists mostly of drying banks. Low water is the best time for navigating the channel as the banks are then either uncovered or made conspicuous by the yellow colour of the water over them. Le Bouton, an islet, lies on the southern side of the channel, about 1¼ miles east-north-eastward of the western extremity of Île du Kersaint and on the outer edge of a drying bank, which

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Chart 3877.

extends offshore for about one cable; a bank, with a depth of 14 feet (4m3) over it, extends about one cable northward from Le Bouton. From a position about 4 miles westward of the eastern extremity of Île du Kersaint, the channel increases in width and the northern side of Île du Kersaint can be kept at a distance of about one cable.

The northern side of Île du Kersaint is hilly; Sommet Aigu, 492 feet (150m0) high, lies 2½ miles from its eastern end and a short distance inland.

Kua Tam.—Dangers.—Kua Tam is the eastern entrance of the inshore channels previously described. It is about 2 cables wide between the banks on either side, with a depth of 19 feet (5m8) in the fairway. Rocher de l'Aréquier (*Lat. 21° 24′ N., Long. 108° 00′ E.*), a red and black rock, about 60 feet (18m3) high, is situated on the western side of the entrance, on the end of a reef which extends 2½ cables from the eastern end of Île du Kersaint; a spit, with depths of 3 fathoms (5m5) or less over it, extends about 1½ cables eastward from Rocher de l'Aréquier.

The northern and north-eastern sides of Kua Tam are formed by a sandbank, with depths of from one foot to 3 fathoms (0m3 to 5m5) over its eastern end, extending for about 4½ miles from the mouth of Rivière de Mon Cay, about 3¼ miles north-westward of the eastern extremity of Île du Kersaint; the western part of this bank dries from one to 5 feet (0m3 to 1m5).

For the bank extending southward from the eastern end of Île du Kersaint, *see* page 378.

Within the entrance Ngok San, 166 feet (50m6) high, at the south-western extremity of Île de Tra Co, lies about 3 miles north-westward of the eastern extremity of Île du Kersaint. A sandbank, which dries from one to 4 feet (0m3 to 1m2), extends about 1¾ miles southward from the south-western extremity of Île de Tra Co, and then eastward for about 2 miles, connecting with the sandbanks forming the northern side of the inshore channel.

Anchorage.—Directions.—The swell penetrates for a considerable distance into Kua Tam during the flood stream in the North-east monsoon, rendering it advisable to anchor about 2 miles within the entrance and about 1½ cables off the northern side of Île du Kersaint, in depths of from 5 to 6 fathoms (9m1 to 11m0), with good holding ground.

This is the nearest anchorage to Mon-Cay. A vessel entering should pass eastward of Rocher de l'Aréquier at a distance of about 2 cables and keep at a distance of about 1½ cables from the northern side of Île du Kersaint towards the anchorage.

Tidal streams.—The tidal streams are strong in Kua Tam, and form dangerous eddies. At about the time of high water the ebb stream in the entrance is already established while the flood stream is still setting in a north-westerly direction through the channel into Rivière de Mon-Cay. At the anchorage, slack water occurs at the same time as high and low water at Pakhoi, and the streams attain a rate of about 2 knots.

Rivière de Mon-Cay.—Beacons.—Buoys.—The southern end of the channel leading across the drying sandbank from the northern side of Kua Tam to the mouth of Rivière de Mon-Cay is marked by a black conical buoy, surmounted by a black cylinder; its northern end is

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Chart 3877.

marked by two red conical buoys, each surmounted by a cone. These buoys are shifted as necessary. Two beacons, close together, are situated about half a mile south-westward of the southern extremity of Île de Tra Co. The mouth of the river is situated between the southern extremity of Île de Tra Co and a point on the mainland about 1½ miles west-south-westward.

Mon-Cay, an important station near the French frontier, lies on the eastern bank of the river, about 5½ miles northward of Ngok San.

Small vessels with local knowledge can reach the settlement at Ngok San, where there is a Custom-house; above that the river can only be ascended by boats at high water.

Tidal streams.—In the high-river season the flow is outwards only, attaining a rate of from 2 to 3 knots. In other seasons a feeble in-going flow is felt while the tide is rising.

Communication.—The settlement at Ngok San is the easternmost port visited by the local vessels which use the inner channels from Haïphong, calling at Quang Yen, Port Courbet, Port Wallut and Tien Yen, with which places there is regular communication. Ngok San and Mon-Cay are both connected to the general telegraph system.

Coast.—Anchorage.—North-eastward of the entrance to Kua Tam, for a distance of about 13 miles, the coast is fringed by extensive sandbanks, which either dry or are marked by breakers. Depths of 5 fathoms (9^{m}1) are found as much as 5 miles offshore in places.

Pak Son Kong Paï, with the shoals north-eastward and south-westward of it, which lies off this part of the coast, are described on page 377.

The entrance to the port of Chuc San lies between the sandbanks a short distance eastward of the eastern end of Île de Tra Co which is situated about 6½ miles east-north-eastward of Ngok San. Chuc San village is situated about 2½ miles northward of the eastern extremity of Île de Tra Co. The port is only accessible to small vessels with local knowledge.

There is anchorage during the North-east monsoon for vessels with local knowledge off the entrance to the port of Chuc San with Cap Pak Loung, bearing 050°, in depths of from 5 to 5½ fathoms (9^{m}1 to 10^{m}1).

Charts 3877, 2062.

Cap Pak Loung.—Cap Pak Loung (*Lat. 21° 30′ N., Long. 108° 13′ E.*), 289 feet (88^{m}1) high, and prominent, lies 8¼ miles eastward of the eastern extremity of Île de Tra Co, and is the south-western extremity of a hilly peninsula projecting from the mainland. A bank, with depths of less than 2 fathoms (3^{m}7) over it, extends 6 cables south-south-westward and westward from the cape.

Wan Xuan.—The entrance to Wan Xuan lies between the high land of Cap Pak Loung and the sandbanks about 6 cables westward. Nearly the whole of the northern and north-western portions of the bay are occupied by drying sandbanks. Several rivers flow into the head of the bay, which lies about 8 miles northward of Cap Pak Loung.

Outside the entrance there is a bar, about 1½ miles wide, over which there are depths of 23 feet (7^{m}0). From a position about three-quarters of a mile westward of Cap Pak Loung, for a distance of about 2 miles north-north-eastward, there are depths in the fairway of from 23 to 36 feet (7^{m}0 to 11^{m}0), and anchorage with good holding ground.

Charts 1965, 2062, 2661a, 1263.

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Charts 3877, 2062.

Farther northward there is a large area where shallow draught vessels can anchor. Vessels should not enter without local knowledge.

Chart 2062.

NORTHERN SIDE OF TONGKING GULF.—With the exception of Pakhoi anchorage (page 387), the northern side of the gulf, between Cap Pak Loung and Kwantau point, about 47 miles eastward, has not been thoroughly surveyed. Wei-chou tao (Guie-chau) (page 390), lies about 23 miles southward of Kwantau point and about 30 miles from the eastern side of the gulf. Vessels should pass westward of this island, as the adjacent waters have not been surveyed, and on account of the numerous fishing stakes which extend off the mainland. These fishing stakes extend for a distance of 30 miles or more, at times, off Pakhoi.

Tidal streams.—In the northern part of the Tongking gulf, the set of the stream during the day is easterly for 8 hours, and westerly for 16 hours throughout the year.

On full and change days in summer the easterly set commences at 1500.
" " " " " westerly " " 2300.
" " " winter " easterly " " 0300.
" " " " " westerly " " 1100.
occurring about one hour later every day after.

The rate is from a half to 1½ knots, being accelerated or retarded by the prevailing monsoon.

Climate and weather.—*See* page 36.

Coast.—Dangers.—Between Cap Pak Loung (*Lat. 21° 30′ N., Long. 108° 13′ E.*) and a point about 9 miles east-north-eastward, on which there is a fort, there is a bay, encumbered with shallow banks. At the head of this bay, Ngan Nan kiang discharges into the gulf. A shoal, with a depth of 2¾ fathoms (5m0) over it, lies about 3 miles east-south-eastward of Cap Pak Loung. A bank, with depths of less than 6 feet (1m8) over it, extends about 3½ miles south-westward from the eastern entrance point of the bay mentioned above; a patch, which dries 6 feet (1m8), lies at the outer end of this bank; an islet, 26 feet (7m9) high, and a rock, above water, lie about one mile and 4 cables, respectively, south-westward of the same point. Tiao Tan, an islet, 82 feet (25m0) high, lies about 1¼ miles south-eastward of the point and close offshore, to which it is connected by a sandbank. The coastal bank between these islets, with depths of less than 5 fathoms (9m1) over it, extends about 3 miles offshore.

Between Tiao Tan and U Loi point, about 18 miles east-north-eastward, lies the estuary of Long Mun river, which is encumbered with numerous shallow banks with narrow channels between them. The village of Long Mun stands on the western bank of the river, about 13 miles north-eastward of Tiao Tan. The town of Yam tiao stands on the banks of a river of the same name, about 15 miles north-north-eastward of Long Mun; it is only accessible to boats.

Tui mui tiao, an islet, 65 feet (19m8) high, lies about 6 cables southward of U Loi point. A one-fathom (1m8) patch and a 3-fathom (5m5) patch lie 7¼ and 8 miles, respectively, southward of Tui mui tiao. A bank, with depths of less than 5 fathoms (9m1) over it, extends about 5 miles southward from the line joining the entrance points of the estuary. The bar of the Long Mun river, over which there is a

Charts 2661a, 1263.

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Chart 2062.

depth of 12 feet (3m7), and which is about half a mile wide, is about 6½ miles eastward of Tiao Tan. No vessel should enter without local knowledge. Sam tan, an islet, 98 feet (29m9) high, with another, 82 feet (25m0) high, close north-eastward of it, lie about 2¼ miles westward of U Loi point.

Between U Loi point and Kwantau point, about 21 miles south-eastward, there is a bay, with depths of less than 6 feet (1m8), extending as far as the line joining the entrance points. A river discharges into the north-eastern part of this bay, about 9 miles north-eastward of Kwantau point. The town of Lien tiao fu stands on the banks of this river about 6½ miles north-north-eastward of its mouth, and is accessible to junks and steam launches.

In the approach to this bay there is a shoal, with a depth of 3 fathoms (5m5) over it, lying 8 miles westward of Kwantau point. Depths of less than 6 fathoms (11m0) extend southward of the line joining the entrance points of the bay for a distance of about 9 miles.

Pakhoi anchorage is situated in the south-eastern portion of the bay.

Chart 3010, plan of Pakhoi anchorage.

Pakhoi anchorage and approach. — Dangers. — Buoys. — Light.—Kwantau point, on the eastern side of the entrance to Pakhoi anchorage, is prominent. It is the western extremity of a low peninsula, on the western end of which is a range of hills, projecting south-westward from the mainland. The hills attain an elevation of 374 feet (114m0) and appear as an island from a distance. A white tower stands on the summit of the 374-foot (114m0) hill. Nautilus hill, 363 feet (110m6) high, lies about three-quarters of a mile north-eastward of Kwantau point (*Lat. 21° 27′ N., Long. 109° 02′ E.*) and about one cable inland. North-eastward of Nautilus hill are two hills, the south-western of which is 195 feet (59m4) high, and the north-eastern, 128 feet (39m0) high, lying at distances of 6 cables and 1½ miles, respectively, which are useful navigational marks.

Approach to Pakhoi anchorage from southward at a distance of 8 miles.
(*Original dated* 1933.)

For about 1¼ miles north-eastward of Kwantau point the coast consists of cliffs, about 70 feet (21m3) high ; farther north-eastward and eastward there are sandhills, and eastward of Tikok, a fishing village situated about 2½ miles north-eastward of Kwantau point, they are from 20 to 30 feet (6m1 to 9m1) high. Behind the latter is a range of well-wooded hills, which attain elevations of from 40 to 60 feet (12m2 to 18m3) ; a conspicuous clump of trees stands on this range about 1¼ miles south-eastward of Tikok.

South-eastward of Kwantau point, a shallow bank, with depths of less than 3 fathoms (5m5) over it, which gradually increases its distance offshore to as much as 5 miles, extends from the south-western side of the peninsula mentioned above.

Between Kwantau point and Tikok the coast is fringed by a bank, with depths of less than 6 feet (1m8) over it, extending about three-quarters of a mile offshore.

Charts 2661a, 1263.

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Chart 3010, plan of Pakhoi anchorage.

The entrance to the channel leading to the anchorage is about 7 cables wide between the bank, with a depth of less than 3 fathoms (5^{m}5) over it, fringing the coast northward and southward of Kwantau point (*Lat. 21° 27′ N., Long. 109° 02′ E.*), and the south-eastern end of a bank, with similar depths over it, which extends in a south-easterly direction from the banks which encumber the bay westward.

The channel is reduced to a width of less than half a mile abreast Tikok, and fishing stakes, with a narrow passage between them, stretch across the channel in a north-westerly direction from that village. The southern and northern sides of this passage are marked by buoys which indicate the ends of the fishing stakes; in 1947, the passage between the buoys was 400 feet (121^{m}9) wide and had a least depth of 30 feet (9^{m}1).

The southern end of a bank, which dries, and which, in 1923, was reported to be extending southward, is charted 6 cables northward of Tikok.

A red buoy, with black horizontal bands, surmounted by a cone, known as "Turning buoy," is moored about 1¾ miles north-north-westward of Kwantau point. This buoy marks the turning point for vessels entering or leaving Pakhoi harbour.

The southern side of the passage through the fishing stakes off Tikok is marked by a red conical buoy surmounted by a black ball; the northern side is marked by a black can buoy.

A black and white vertically-striped buoy is moored in the upper anchorage, in a depth of 1½ fathoms (2^{m}7), within which the depths decrease rapidly, and above which no vessel drawing more than 12 feet (3^{m}7) should anchor.

Anchorages.—Directions.—Pakhoi anchorage, situated northward of Kwantau point, affords anchorage for vessels of moderate draught. The anchorage is protected by sandbanks on its northern side and it is open south-westward. During the North-east monsoon, working cargo is often difficult.

There is anchorage off Tikok, in depths of from 4 to 5 fathoms (7^{m}3 to 9^{m}1). North-eastward of the fishing stakes, there is anchorage, in depths of from 3½ to 4 fathoms (6^{m}4 to 7^{m}3). It was reported, in 1928, that greater depths exist in the harbour than are shown on the chart.

There is good anchorage with the new Custom-house flagstaff bearing 106°, the prominent go-down, 154°, and the north-western extremity of the coast at Tikok, 239°, in a depth of 3 fathoms (5^{m}5).

Kwantau point may be approached bearing 350°, until at a distance of about one mile, when course should be shaped to pass half a mile south-westward of it; when abreast the point, course should be gradually altered to 000°, to round the bank extending off Nautilus hill and the sand cliffs. When Tikok bears 080°, course may be shaped for the anchorage. If proceeding to the anchorage north-eastward of the fishing stakes, a vessel must pass between the two buoys marking the passage through them.

Tidal streams.—The tidal streams set through the anchorage at a rate of from 2 to 2½ knots at large tides, and half a knot at small tides. The north-east-going flow begins one hour after low water; the south-west-going flow one hour after high water.

Light.—A light is exhibited from the north-western corner of the New Custom house roof.

Charts 2062, 2661a, 1263.

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Chart 3010, plan of Pakhoi anchorage.

Pakhoi.—Pakhoi is situated on the southern side of the harbour, about 2 miles eastward of Tikok. It is the port of Lien tiao (page 387). There are a few Europeans who live at the eastern end of the town.

A conspicuous new Custom house, with a tall flagstaff, is situated at the eastern end of the town. A prominent go-down, which, in 1936, was painted white and inscribed "Asiatic Petroleum Co., Ltd." on its western side and having Chinese characters on its northern side, is situated close westward of the town.

There is no landing pier at Pakhoi, but landing is effected from a trolley which is pushed into the water and hauled out by coolies; landing can also be effected on the beach from a skiff. The best landing place is at the Customs house.

There are two hospitals, one British and the other French.

Trade.—The exports consist of indigo, hides, pigs, sugar, leather and aniseed; and the imports are Indian cotton, metals, rice, flour, kerosene, woollen goods, ironware, cement, soap and hemp.

Communication.—There is frequent steamer communication with Hong Kong and other ports in the far East.

There is a Chinese post office, which is connected to the general telegraph system.

Harbour regulations.—Harbour regulations, extracts of which are given below, have been established for Pakhoi, and Masters of vessels should ascertain the details from the harbour office.

The anchorages for foreign vessels are:

For vessels other than those referred to below: Between imaginary lines drawn northward from Tikok (*Lat. 21° 29′ N., Long. 109° 04′ E.*) and from the Customs house.

For vessels with explosives and for quarantine purposes: That part of the anchorage which lies $3\frac{1}{2}$ cables eastward of the western limit of the above.

Explosives.—Men-of-war may on application to the Harbour master transfer explosives within the ordinary anchorage by their own crews under the command of an officer.

The transfer of explosives by any other vessels is subject to special regulations, and in every case craft of any description transferring explosives must show a red flag at least 6 feet by 4 feet (1^m8 by 1^m2) not less than 12 feet (3^m7) above the highest part of the hull.

Mineral oil or high inflammables.—Vessels with these cargoes must anchor as directed by the Harbour master.

Infectious disease.—Vessels having infectious disease or which are suspected of having it shall hoist the quarantine flag and anchor in the quarantine anchorage, and keep the quarantine flag displayed until pratique has been granted.

Miscellaneous.—The sounding of the whistle, siren, &c., is prohibited except in compliance with the Regulations for Preventing Collisions at Sea or for warning others of danger.

No vessels other than men-of-war may use swinging booms, and they must be rigged in from sunset to sunrise.

Vessels arriving from Hong Kong are requested to display flag N of the International Code of Signals at the fore, those from Haïphong flag F of the same code.

The following harbour signals are made by flags of the International Code of Signals: O flag, coolies wanted; C flag, Customs officer

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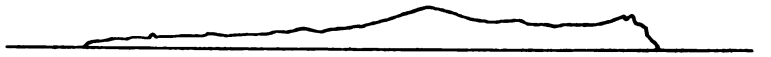
Chart 3010, plan of Pakhoi anchorage.

wanted ; B flag, explosives on board ; NQ flags, fire on board ; Q flag, quarantine ; R flag, water-boat wanted ; Y flag, ash-boat wanted ; G flag, doctor wanted.

Chart 2062.

Coast.—Off-lying dangers.—Pak-fu-tau sha, which dries, with a shoal which breaks, from 2 to 3 miles eastward of it, lies about 11 miles east-south-eastward of Kwantau point and 2½ miles offshore. A shoal, with a depth of 1½ fathoms (2m7) over its southern end, and extending north-north-eastward for about 2 miles, was reported, in 1898, to lie about 3 miles south-south-eastward of Pak-fu-tau sha. This part of the coast should be given a wide berth.

NORTH-EASTERN SIDE OF TONGKING GULF.—Off-lying islands.—Wei-chou tao (Guie-chau) (*see* page 386) is, on its southern and western sides, composed of hills rising abruptly from the sea, but sloping towards the coast on the north-eastern side. Humpel hill, the summit, is 274 feet (83m5) high, near the south-eastern extremity of the island ; on it is a prominent tower. There are two churches on the northern side of the island which are also prominent.



Wei-chou tao.
(*Original dated* 1933.)

A reef extends about one mile from the northern side of the island and about a quarter of a mile from the south-western and eastern sides. Foul ground extends beyond the reef on the northern side. Northward and eastward of the island, the head of Tongking gulf is shallow and encumbered with fishing stakes, and vessels should not pass eastward of the island. At night, the island should not be approached within depths of less than 10 fathoms (18m3).

Discoloured patches of small diameter, having the appearance of shoal water, are very common between Wei-chou tao and Pakhoi ; they are only detached mud whirls or weed patches.

Chart 2062, plan of Namwan bay.

Nan wan (Namwan bay), on the southern side of Wei-chou tao, is entered between West point (*Lat. 21° 00′ N., Long. 109° 06′ E.*), the southern extremity of the island, and East point, about 1½ miles east-north-eastward. A bank, with depths of less than 3 fathoms (5m5) over it, and on which there is a rock, with a depth of less than 6 feet (1m8), extends about 2½ cables south-eastward from West point, and close outside it is a shoal, with a least depth of 2¼ fathoms (4m1) over it. A spit, with a depth of one foot (0m3) over its outer end, extends about 1¾ cables southward from East point.

The north-western and northern sides of the bay are fringed by a bank, with depths of less than 3 fathoms (5m5) over it, which extends about 2 cables offshore. A reef extends about 1¼ cables south-westward from the north-eastern side of the bay, and on its outer end is Chu-tzu Tsui (Petit Cochon), a rocky islet, 95 feet (29m0) high, lying about 4½ cables westward of East point. There is a prominent white house at the head of the bay, and a village on the north-eastern shore.

Charts 2661a, 1263.

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Chart 2062, plan of Namwan bay.

Good anchorage may be obtained in the bay, in depths of from 4 to 5 fathoms (7m3 to 9m1), with good holding ground; it is sheltered from all winds except those from between south-south-east and east-south-east, but southerly winds are never very strong.

Chart 3892.

Chai-une, an island, 498 feet (151m8) high, lies about 8 miles south-eastward of Wei-chou tao; on its western side is a high steep cliff; a village is situated in the valley in the middle of the island. In 1932, it was the resort of well-armed Chinese pirates.

Chai-une was reported, in 1933, to lie 2½ miles southward and eastward of its charted position.

South-eastward of the island long streaks of weed and patches of discoloured water may be seen, but the soundings only indicate a gradual change of depth. Vessels are recommended to avoid the neighbourhood.

Charts 3892, 2062.

Coast.—Dangers.—The north-eastern side of Tongking gulf is mostly formed by the western side of the Lui-chow peninsula. Between Kwantau point and Nau sa point, about 80 miles south-eastward, the coast has not been surveyed. Numerous banks exist offshore, and there are many fishing stakes.

Pak-fu-tau sha, with the shoals eastward and south-south-eastward of it, is described on page 390.

About 30 miles eastward of Kwantau point, at the north-eastern head of Tongking gulf, there is a bay, the entrance to which is about 20 miles wide. This bay is encumbered with numerous shallow banks, between which is a narrow channel, usually marked by stakes, leading to Shek tau po and Shan hau, with Chinese villages on its shores.

Onpo (Um po) (*Lat. 21° 25′ N., Long. 109° 51′ E.*), on the eastern side of the bay, is approached between Teo shin sha and Tam-kon-sha, the rough outlines of which are indicated on the chart. Tai sha tau is situated on the north-western side of Teo shin sha, about 4 miles offshore.

The channels in the bay are available for small craft with local knowledge.

Inland, there is a mountain range; Pak mah chong, a peak at the western end of the range, is about 2,000 feet (609m6) high, and is situated about 25 miles north-north-eastward of Shek tau po. Kukun chong, 2,390 feet (728m5) high, lies about 11 miles eastward of Pak mah chong.

Southward of the above-mentioned bay Sam-sha and Bau cum sha, the outlines of which are indicated on the chart, lie about 40 and 30 miles, respectively, north-north-westward of Nau sa point, and about 5 miles offshore.

Chart 3892.

Mong tau point, about 13 miles north-north-westward of Nau sa point, is reported to be foul for a distance of 5 or 6 miles offshore. Ushek point lies about 6 miles south-eastward of Mong tau point. Nau sa bay is entered between Ushek point and Nau sa point. There is a village and a river of the same name at the head of the bay.

Nau sa river is reported to be navigable by large vessels for a distance of from 2 to 3 miles and, by small craft, for several miles farther; both banks are lined by perpendicular walls of coral. The river is,

Charts 2661a, 1263.

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Chart 3892.

however, too narrow to permit of large vessels turning. The river is also reported to afford good shelter during typhoons.

Nau sa point, which is low and shelving, consists of a ridge of lava, the outer end of which is covered at high water; a dangerous reef extends about 8 cables westward from the point.

The coast near Nau sa bay is low and wooded, rising gradually to Mount Carpenter, the flat summit of a range of mountains situated about 13 miles north-north-eastward of Nau sa point and 4 miles inland. Ushek hill lies detached from the range, about 4 miles west-south-westward of Mount Carpenter and close to the coast.

Approaching from westward or north-westward, Mount Carpenter is the first land to be seen. The Shenwen range, 510 feet (155m4) high, with a conspicuous tree on it (page 423), will be seen some time before Cape Kami, situated about 10 miles south-south-eastward of Nau sa point.

For the coast south-eastward of Nau sa point, including Cape Kami, *see* page 424.

Chart 2062.

HAINAN ISLAND.—General description.—Hainan island forms the south-eastern side of Tongking gulf; its northern part is separated from Lui-chow peninsula by Hainan strait, about 10 miles wide.

Hainan island forms part of the Chinese province of Kwangtung. Its southern half is mountainous, attaining an elevation of 5,870 feet (1,789m2) in the Great Ng chi range, locally known as Loi Vöe (*Lat. 19° 11′ N., Long. 109° 45′ E.*), and an elevation of 6,300 feet (1,920m2) in the Five Finger mountains which are sometimes visible from Hainan strait; southward of these are the Seven Finger mountains. The northern portion of the island is low, with a few scattered hills, presenting totally different geological characteristics from the southern half, giving the impression that the two have at some time been united by a volcanic upheaval. The mountains are covered with dense vegetation, and in the plains rice, sugar-cane, areca or betel-nut and tobacco are grown.

The south-eastern and southern coasts of this island are generally bold to approach, but banks have been reported in places, and others may exist. Off the western coast there are several shallow banks, the farthest known of which is 19 miles offshore.

The southern coast is indented with several bays affording good anchorage and shelter during the North-east monsoon period, but they are partly open to southerly winds; the north-western coast also affords good anchorage.

Climate and weather.—*See* page 36.

Caution.—The island, with the exception of the southern shore of Hainan strait and the harbour of Yuling chiang on the southern side of the island, has not been surveyed, consequently the position of a vessel is not to be accurately obtained by cross bearings.

Inhabitants.—The population is composed of three distinct tribes; those in the interior are known as Lois and are supposed to have come originally from Cochin-China; the Miaos, who are considered to be the original inhabitants, are scattered through all the southern districts of Hainan; and the Hakkas, who live in scattered villages throughout the island. The coastal population on the north-eastern,

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Chart 2062.

southern and south-western sides consist mainly of Chinese, who obtain their living by cultivating the soil, fishing, and by occasional acts of piracy; those at the northern end of the island are known as the Tai people.

There are numerous fast sailing fishing-boats and junks belonging to the island; many of them go every year on fishing voyages, and navigate to seven or eight hundred miles from home, to collect bêche-de-mer, and procure dried turtle and sharks' fins, which they find amongst the numerous shoals and sand cays in the south-eastern part of the China sea. Their voyages commence in March, and they continue to fish until the early part of June, when they return, picking up their small parties left on various cays.

The population of the island, in 1946, was estimated to be 2,500,000, 90 per cent of whom are Chinese.

Trade.—Agricultural products are the principal exports, of which cattle, pigs, hides and eggs are the most valuable. The principal imports are manufactured goods, cereals and oil fuel.

Rivers.—Pei chang ch'i (Pochin river) rises in the Great Ng Chi range, and drains the whole of the north-eastern portion of the island, falling into Hainan strait near Chiung chow (Kiungchow). It is always navigable as far as Fa hi, situated about 13 miles southward of the head of Cheng-mae wan (page 419), and usually to Ka-lit (*Lat. 19° 39′ N., Long. 109° 58′ E.*); it is, however, greatly obstructed by large water wheels.

Ka chek river rises in the Five Finger Mountains, and enters the sea near Pak ngo (page 408), on the east coast; it is navigable as far as Tin Fou, about 24 miles westward of Pak ngo.

Ch'ang ch'iang (Sanghoe) ho rises in the great Ng Chi range, and discharges into Changhua bay, on the west coast. Very little is known of it, but it is navigated by Chinese boats as far as Ngava.

Fauna.—The fauna of Hainan differs from that of Kwangtung. There are three species of deer, leopards, bears (the latter, according to the Lois, attain the size of a pony in the Five Finger district and are exceedingly ferocious), monkeys, squirrels, porcupines, ant-eaters, and flying foxes. Of reptiles there is a large variety, pythons attain a length of 30 feet (9^{m}1) or more, boa constrictors, lizards, cobra, bamboo and coral snakes which are deadly. Fish in endless variety—the Hainan whale, sharks, and a quantity of tropical fish; carp, roach, dace, and barbel are found in the rivers. There are some 170 species of birds, amongst which are the silver pheasant, jungle fowl, partridges, and almost every kind of water-bird.

Flora.—The flora of the island offers a practically new field to the botanist; the types found are more akin to those in Malaya and the Philippines than those in the southern provinces of China.

Production.—Industry.—Iron and copper are found in large quantities, and a small amount of tin and magnetite. Salt is produced in many places on the south-western coast and exported. Agriculture is the predominant occupation. Among the fruits are coconut, papaw, mango, lichee, pineapple, custard apple, orange and banana. There is an immense quantity of timber on the mountains, mainly oak. Of the chief agricultural products, only sugar cane is exported in any large quantity.

The largest industry besides mining and agriculture production is

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Chart 2062.

that of fishing and fishing canneries. The rattan is a permanent industry in the Lois country.

Missions.—An American Presbyterian mission is established in the island, inaugurated in 1881. There are stations at Hoihow, Chiung chow (Kiungchow), Nodoa, and Ka chek. At Hoihow and the last two towns there is a hospital.

Roman Catholic missions were established in the island as far back as 1630. The number of Roman Catholics now in the northern part of the island is very small.

Harbours.—The principal harbours in Hainan are Hoihow, on the northern side, Pasuo on the north-western side, Yuling chiang and San-ya on the southern side.

Tidal streams.—Off the south-western and south-eastern coasts the monsoon currents are considerable; the average monthly rates being from three-quarters of a knot to one knot in a south-westerly direction from October to March, and from half a knot to three-quarters of a knot in a north-easterly direction from June to August.

For tidal streams in Hainan strait and its approaches, *see* page 424.

SOUTH-WESTERN SIDE.—Aspect.—On the south-western and western coasts of Hainan island are several mountain summits useful for identifying the coast when approaching. Pagoda mountain, which has four peaks, lies about 13 miles north-north-westward of Chinmu chiao (Cape Bastion) (*Lat. 18° 09′ N., Long. 109° 36′ E.*), the southern extremity of the island. Horn mountain, 3,160 feet (963^{m}2) high, lies about 20 miles north-westward of Chinmu chiao and 7 miles inland. From eastward, the summit of this mountain has the appearance of a horn, but from westward it is rounded.

South-west point, the south-western extremity of Hainan island, is situated about 56 miles west-north-westward of Chinmu chiao. Chien Feng Ling (Mount Etna), a good landmark, 4,380 feet (1,335^{m}0) high, is situated 17 miles north-eastward of South-west point. This mountain shows as a precipitous crater from south-eastward or north-westward, but, viewed from westward, it appears as a single pinnacle. *See* view on chart 2062.

There are several fine valleys, notably at the head of Yuling chiang, entered close westward of Chinmu chiao, at Yaichu bay, about 30 miles westward of Chinmu chiao, and between the western entrance point of Yaichu bay and South-west point.

Farther inland, about 47 miles northward of Chinmu chiao, are the Five Finger mountains (page 392), the summit of the island. The Great Ng Chi range, in which there are many peaks over 4,000 feet (1,219^{m}2) high, lies about 12 miles north-westward of the Five Finger mountains. These mountains will probably be enveloped in clouds at most times.

Offshore, whirlpools or eddies, caused by the tidal streams or current passing over uneven bottom, are frequently met with and have been reported as breakers.

Charts 3893, 2062.

Coast.—Chinmu chiao is the southern extremity of a high, bold, and rocky peninsula, 850 feet (259^{m}1) high. The depths a short distance off it are considerable. Between it and Chanching chiao,

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Charts 3893, 2062.

about 1¼ miles north-westward, there is a bluff which has two vertical streaks running down to the sea.

Chart 3893.

Yuling chiang. — Lights. — Signal station. — Yuling chiang is entered between Chanching chiao, a point, 134 feet (40m8) high, and Ta long chiao (Cape Salomon) (chart 2062), about 4½ miles west-north-westward, *see* page 396.

The harbour at the head of Yuling chiang affords the best anchorage on the southern side of Hainan island. Sheng tao, 95 feet (29m0) high, lies close offshore about one mile north-north-eastward of Chanching chiao, and is connected to the main island by foul ground. Between Sheng tao and Lotao chiao, a point 1¼ miles northward, there is a bay, the shores of which are mostly fringed by reefs, extending in places one cable offshore. Between Lotao chiao and Tung chiao, 9 cables north-westward, there is a bight, the shore of which is mostly fringed by reefs extending about half a cable offshore. At the head of the bight, about 3 cables northward of Lotao chiao (*Lat. 18° 12′ N., Long. 109° 33′ E.*), is a pier, near the root of which is a conspicuous white chimney, 182 feet (55m5) high, and some buildings.

Yuling chiao, about 1¼ miles west-south-westward of Lotao chiao, is the southern extremity of a peninsula, which rises to an elevation of 500 feet (152m4) about one cable within the extremity of the point. Between the point and a point about one mile northward, the eastern side of this peninsula is fringed by a reef, and a bank, with depths of less than 3 fathoms (5m5) over it, extends about 1¼ cables offshore. A patch, which dries, lies one cable offshore about 2 cables south-south-eastward of the northern point.

A light is exhibited on the 500-foot (152m4) summit one cable within Yuling chiao, and another light is exhibited from a position about one cable south-south-westward of the northern point of the peninsula mentioned above. There is a signal station close to this light, and there is a flagstaff about one cable northward of it.

Harbour. — Beacons. — Buoyage. — At the northern end of Yuling chiang is a narrow channel entered between Tung chiao and Hsi chiao, about 2½ cables westward, both of which are low and sandy. Between Tung chiao and a point about 2½ cables north-north-westward, a reef extends about 1¼ cables offshore and narrows the channel leading into the harbour to a width of nearly one cable.

Three white leading beacons, each surmounted by a triangle, are situated on the northern shore of the harbour, about one mile north-westward of Tung chiao, and in line, bearing about 330°, lead through the entrance; the rear beacon stands on a hill, 167 feet (50m9) high.

Two white leading beacons, each surmounted by a triangle, stand on the sandbank extending from the southern shore about half a mile north-eastward of Tung chiao, and in line bear 075°.

The entrance channel had, in 1949, a least depth of 33 feet (10m1) on the leading line. It is marked by two can light-buoys, painted black, on the western side and two can light-buoys, painted red, on the eastern side. Two red conical buoys mark the edge of the bank on the southern side of the fairway about 2¾ cables north-north-westward of Tung chiao. There are several mooring buoys in the harbour. Close westward of the western entrance point a small port has been constructed consisting of a concrete wharf, 923 feet (281m3) in length,

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Chart 3893.

with a depth of 22 feet (6m7) alongside the greater part of its length, but shoaling to 3 feet (0m9) at its northern end. Westward of the wharf there is a small boat camber, two boat slips, a number of buildings and a jetty, about 150 feet (45m7) long; north-westward of the small port is the town of Yuling, consisting of a number of well-constructed buildings including a hotel; the town is connected with San-ya by a good road.

Eastward of the eastern entrance point of the harbour is a concrete wharf, 520 feet (158m5) in length, with a depth of 32 feet (9m8) alongside, except at its south-western extremity, where depths decrease to 29 feet (8m8). This wharf is primarily used for the loading of iron ore and is equipped with two conveyors.

On the north-eastern side of the harbour is a village. The northern part of the harbour is very shallow and consists almost entirely of saltpans; a railway runs along the shores of the harbour, terminating at Yuling (*Lat. 18° 13′ N., Long. 109° 31′ E.*).

The shores of the harbour are fringed by shallow banks, and near the middle of the harbour, about half a mile north-north-westward of Tung chiao, there is a patch which dries, with a rock, with a depth of less than 6 feet (1m8) over it, close south-eastward of it. The harbour is backed by hills, and a river discharges into its north-eastern end.

During the North-east monsoon the wind blows from east-north-east across Yuling chiang.

Anchorage.—Directions.—Anchorage may be obtained, in a depth of 44 feet (13m4), with the conspicuous chimney bearing 044° and Tung chiao 321°. The best time to enter is at low water, the dangers being then more prominent. A vessel bound for the iron-ore wharf should proceed through the entrance with the three leading beacons on the northern side of the harbour, in line, bearing about 330°, until the leading beacons on the southern side of the harbour are in line, bearing 075°, when she should keep on this alignment until abreast the wharf.

If proceeding to the town wharf the vessel should alter course westward when she is inside the entrance. When berthing alongside care should be taken to use only the southern 700 feet (213m4) of the wharf, as there is shoal water at the northern end.

Chart 2062.

Coast.—Ta long chiao is the south-eastern extremity of a peninsula, 853 feet (260m0) high, connected to the mainland by a low isthmus and is very prominent. San ya chiang lies on the western side of this peninsula.

Chart 1019, plan of Sama port.

San-ya port. — Light. — Dangers. — Buoys. — San-ya (Sama) port lies in the north-eastern part of San ya chiang, and is entered between a point about 2½ miles northward of Ta long chiao and Pai pai, the south-westernmost of a group of islands about 6 cables north-westward.

Hsiao chow, an islet, 82 feet (25m0) high, lies about 2½ cables westward of the south-eastern entrance point; the area between them is foul.

A light, privately maintained, is exhibited from a white beacon on Pai pai (*Lat. 18° 14′ N., Long. 109° 30′ E.*).

A rock, awash, lies half a cable north-eastward of the south-eastern

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Chart 1019, plan of Sama port.

entrance point and a number of rocks, above water, lie close off the southern shore of the port; one of these, a high rock, larger than the others, lies about 3½ cables east-north-eastward of the south-eastern entrance point. Rocks, above water, extend half a cable northward from this rock, and a rock, awash, lies about half a cable west-north-westward of it.

A ridge of rocks, which dry about 2 feet (0m6), extends about 6½ cables north-eastward from Pai pai; its north-eastern end is marked by a red conical buoy.

A black conical buoy and a red conical buoy are moored about 4 and 7½ cables, respectively, eastward of the light-beacon on Pai pai.

A small river, affording shelter to junks and boats, discharges into the south-eastern part of the port.

The town of San-ya (Sama), a large fishing station, is situated along the eastern shore of the port.

Just within the river mouth, on the northern side, is a quay with about 400 feet (121m9) of berthing space and a depth, in 1946, of about 9 feet (2m7) alongside; on the quay is a 30-ton crane and some sheer-legs with a lift of 10 tons; eastward of the quay are some boat slips.

Westward of the river mouth are some mooring buoys.

Three piers extend from the north-eastern shore of the bay about 1½, 2 and 3½ miles north-westward of the town and in their vicinity are numerous buildings.

Anchorage.—During the North-east monsoon anchorage may be obtained outside the entrance of San-ya port, in a depth of about 5 fathoms (9m1), or within the entrance, in a depth of 2 fathoms (3m7).

The anchorage should be approached with the high rock, which lies close off the southern shore, bearing 087°, and vessels should anchor as convenient.

Chart 2062.

San ya chiang.—Islands and dangers.—The head of San ya chiang is fringed by a bank, with depths of less than 3 fathoms (5m5) over it, extending about half a mile offshore.

Tung chow chiao (East island), 224 feet (68m3) high, lies about 4 miles west-south-westward of Pai pai light-beacon. A 4¼-fathom (7m8) patch lies about 6 cables north-eastward of the south-eastern point of the island and about 4 cables from the eastern side.

Hsi chow (West island), 287 feet (87m5) high, and wooded, lies about 2 miles west-north-westward of Tung chow chiao. Pi tzu ling, an islet, 123 feet (37m5) high, lies close off the south-western extremity of Hsi chow, to which it is connected by foul ground. A bank, with a depth of 5 fathoms (9m1) over it, extends about half a mile from the north-eastern side of Hsi chow. A reef, with two rocky heads, lies about 1½ miles south-eastward of the island, and Pan lu shih, a rock, with a depth of 3 feet (0m9) over it, lies about one mile south-westward of the island. Vessels are recommended not to pass between Tung chow chiao and Hsi chow (*Lat. 18° 14′ N., Long. 109° 23′ E.*).

Coast.—Dangers.—A reef, with a depth of 2 feet (0m6) over its outer end, extends about 1¼ miles south-westward from a point, 356 feet (108m5) high, situated 9½ miles west-north-westward of the entrance to San-ya port. Ta shih, a rock, 31 feet (9m4) high, lies on this reef, about 2¾ cables from the point.

Great cape, which lies about 9 miles westward of Ta shih, has a flat

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Chart 2062.

summit, and rises to an elevation of 1,605 feet (489m2) about three-quarters of a mile within it, and has a slight saddle. A hill, on which there is a pagoda, lies about 5 miles eastward of Great cape. The coastal bank, with depths of less than 5 fathoms (9m1) over it, extends from 2 to 3 cables from the cape.

Yaichu bay lies between Great cape and Snake point, about 12 miles west-north-westward. Ning Yuan ho discharges into the eastern end of the bay, about 5 miles north-westward of Great cape. It is reported to be only navigable by boats in the rainy season. The town of Yai, which stands about 3½ miles up the river, is the principal trading place on the southern side of Hainan island.

Snake point (*Lat. 18° 22′ N., Long. 109° 00′ E.*) has two hummocks, 113 feet (34m4) high, on its extremity. The high land closes the coast at this point, then recedes and forms a background to the level plain of Yai, closing the coast again at Great cape.

Anchorage.—Yaichu bay is exposed to southerly and south-westerly winds, but affords good anchorage during the North-east monsoon about 2 miles from the beach at its head, in a depth of 5 fathoms (9m1); from this anchorage to the shore, the depths decrease gradually.

A good position is in a depth of about 4¾ fathoms (8m7), with Great cape bearing 120°, and Button islet (*see* below), 270°.

The coast between Snake point and South-west point, about 20 miles west-north-westward, is low and bordered with sandy hillocks, from 20 to 40 feet (6m1 to 12m2) high. There are several villages along this coast, the largest of which is Pau Ping.

South-west point is bare and sandy, and the land near it is flat. A white pagoda, surrounded by trees, stands close to the coast about 2 miles eastward of the point. False hill, 387 feet (118m0) high, is situated about 5 miles east-north-eastward of South-west point, and Flat hill, 825 feet (251m5) high, lies about 4 miles north-north-eastward of False hill. *See* view on chart 2062.

Off-lying islets and dangers.—Tung-lo tao (Tung-lo or Mud islet), 230 feet (70m1) high, and Button islet or Siku, 243 feet (74m1) high, lie about 1¾ miles southward and 2¾ miles south-westward, respectively, of Snake point. A 4½-fathom (8m2) patch lies about 1¾ miles south-eastward of Tung-lo tao. Maddock rock, which dries, lies about 2 cables north-eastward of Button islet. A bank, with a least depth of 3 fathoms (5m5) over it, lies about 2 miles southward of the same islet.

A shoal, with a least depth of 1½ fathoms (2m7) over it, lies about 5 miles west-north-westward of Button islet. Northward of this shoal the coastal bank, with a depth of 2 fathoms (3m7) over its outer end, extends about 2¾ miles offshore. A 1½-fathom (2m7) patch lies 7 miles north-westward of Button islet, and a shoal, with a depth of 2½ fathoms (4m6) over it, lies about 1¼ miles westward of this patch and nearly 3½ miles south-south-westward of a point, situated about 9 miles north-westward of Snake point. A 4½-fathom (7m8) patch lies 6 miles south-south-westward of the same point. Great cape, bearing 098°, open southward of Snake point, leads southward of all these dangers except the 3-fathom (5m5) bank about 2 miles southward of Snake point.

Anchorage.—There is anchorage, during the North-east monsoon,

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Chart 2062.

2 miles south-eastward of South-west point, off the white pagoda, in depths of from 6 to 8 fathoms (11m0 to 14m6), sand.

This anchorage is untenable during the South-west monsoon.

Caution.—Tide-rips and eddies are very frequent off this coast, and their appearance has often been reported as shoals, through not investigating them at the time by obtaining soundings.

Winds.—Within 5 or 6 miles of this part of the coast, the North-east monsoon blows from north-east or east-north-east off Yuling chiang; from north-east to south-east off Great cape; is light and variable off Snake point; from north to north-north-west off South-west point; and from north to north-by-east off Kam yan koh (*see* below); with a tendency to blow off the land at night.

Tidal streams.—In rounding Ta long chiao the tidal streams must be considered, especially the east-going stream, which runs very strongly.

WESTERN SIDE OF HAINAN ISLAND.—Coast.—Ying Khoa, a large fishing village, stands on South-west point. A reef fronts the village and numerous fishing stakes extend a considerable distance offshore. Landing should be effected in native boats.

Between South-west point and Kam yan koh or Shoal point, about 22 miles northward, there is a shallow bight. South-west hill, 664 feet (202m4) high, with a village on its southern side, stands close to the coast midway between the two points. A hill, 1,085 feet (330m7) high, lies about 1½ miles east-north-eastward of South-west hill.

The coast between South-west point (*Lat. 18° 31′ N., Long. 108° 41′ E.*) and South-west hill is sandy and flat, but near the latter coconut plantations are common. Near Kam yan koh, sand again predominates; thence to T'ung-hai-t'an (Telanchau or Pyramid point), about 11 miles northward, there is a sandy plain, with occasional scrub and lagoons. The coastal bank, with depths of less than 3 fathoms (5m5) over it, extends nearly 6 miles offshore here, but its limit is uncertain. The village of Kam yan stands about 1¾ miles north-north-eastward of Kam yan koh.

Kam yan sha, a bank, on which there are sunken rocks, extends over 4 miles south-westward and westward from Kam yan koh; a 3-foot (0m9) patch lies 6½ miles south-south-westward of the same point. There are tide-rips over, and westward of Kam yan sha. A rock, 10 feet (3m0) high, lies 1¾ miles southward of T'ung-hai-t'an, and close offshore.

Bakli bay.—Bakli bay is entered between T'ung-hai-t'an and Segansha point, about 7½ miles northward. T'ung-hai-t'an is low, flat and sandy, except for a rock, 138 feet (42m1) high, on it, which is prominent. A reef fringes the south-eastern shore of the bay for 2 miles north-eastward of T'ung-hai-t'an, and there are depths of 3 fathoms (5m5) close outside the reef. The rock on T'ung-hai-t'an, bearing 215°, leads clear of the reef.

At the head of the bay is Bak Li village, in which there is a fort. A reef, covered at high water, extends about one cable offshore near the village, and is connected to Segansha point (*Lat. 19° 12′ N., Long. 108° 37′ E.*) by a low sandy beach. The depths are not greater than 2 fathoms (3m7) at a distance of 2 miles offshore, and a bank, with depths of less than 3 fathoms (5m5) over it, extends 4½ miles west-south-

Charts 2661a, 1263.

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Chart 2062.

westward from Segansha point. Vessels finding it necessary to enter the bay should use extreme caution.

In 1946, a dredged channel, the outer end of which lay close northward of T'ung-hai-t'an, and was marked by a red conical buoy, led north-eastward for about 6 cables to the artificial harbour of Pasuo; at that date the least depth in the channel was 24 feet (7m3), but no maintenance work was in progress.

Pasuo harbour.—Pasuo harbour is protected by two long breakwaters, with a small detached breakwater situated between their outer extremities; the breakwaters are constructed of large concrete blocks and are awash at high water.

The entrance to the harbour is 700 feet (213m4) wide and lies between the outer extremity of the northern breakwater and the northern end of the detached breakwater; in 1946, the centre of the entrance was obstructed by a blockship, and entrance to the harbour was restricted to a channel situated between the northern end of the detached breakwater and a damaged beacon which stood about 120 feet (36m6) northward.

On the north-eastern side of the harbour there is a wharf, 1,090 feet (332m3) in length, on which are conveyors for loading iron ore. In 1946, the least depth alongside the northern part of the wharf, for about 700 feet (213m4) of its length, was 18 feet (5m5), but shoaler water exists southward, and, at that date, a damaged conveyor restricted berthing space. There are no port facilities.

Vessels entering Pasuo harbour should do so about the time of low water as the breakwaters, and other dangers, are then clearly visible.

Coast.—Changhua bay, which is shallow, is entered between Segansha point and Bluff point, about 9½ miles north-north-eastward. Ch'ang ch'iang ho (Sanghoe river) with several mouths discharges into the head of the bay. Sanghoe, a walled town, is situated about 5 miles north-eastward of Segansha point.

Southern bank, on which the sea breaks in a fresh breeze and can generally be distinguished by the discoloration of the water, extends about 5 miles from Segansha point and from the south-eastern side of the bay with depths of less than 3 fathoms (5m5) over it. Two detached shoals, the south-eastern with a least depth of 4¾ fathoms (8m7) over it, and the north-western, with a least depth of 4 fathoms (7m3), lie about 6 miles south-westward and 6½ miles westward, respectively, of Segansha point (*Lat. 19° 12′ N., Long. 108° 37′ E.*).

Northern bank, on which the sea seldom breaks and the extent of which is doubtful, is situated in the northern approach to Changhua bay, approximately from one to 6 miles westward of Bluff point.

Bluff point, 120 feet (36m6) high, is bold and rocky. There is a depth of 4 fathoms (7m3) close off its southern shoulder, which forms the northern entrance point of Changhua bay, and a depth of 8 fathoms (14m6) close westward of its northern shoulder. A narrow reef fringes the northern side of this shoulder. There is a high sand cliff on both faces of the point, that on the southern face falling abruptly into Changhua bay; the latter declivity, bearing 061°, was reported, in 1881, to lead between Northern and Southern banks.

Between T'ung-hai-t'an and a point on the coast a few miles southward, Chien Feng Ling (page 394) is not visible when within 15 miles of the coast, being hidden by mountains in the foreground.

Charts 2661a, 1263.

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Chart 2062.

Off-lying dangers.—South-west bank, consisting of two patches, with depths of 3 feet (0m9) over them, about one mile apart in a north-westerly direction, is situated about 4½ miles west-south-westward of South-west point. The sea breaks on South-west bank with a moderate swell; the bank is steep-to on its south-western side, and is connected by a shallow ridge, to a shoal with a depth of one fathom (1m8) over it, lying 3½ miles north-westward of it; a 3-fathom (5m5) shoal was reported, in 1926, to lie 3 miles farther north-westward. A shoal, with a depth of 4½ fathoms (8m2) over it, lies about 12½ miles west-north-westward of South-west point.

Outer bank, consisting of sand, with a depth of 1½ fathoms (2m7) over it, lies about 18 miles west-north-westward of South-west point. This shoal is steep-to on its northern and southern sides, and the sea breaks on it in a moderate swell, but it does not show when the water is smooth. Comète bank, with a depth of 4½ fathoms (7m8) over it, lies about 2 miles northward of the shoalest part of Outer bank.

A shoal, with a depth of 3 feet (0m9) over it, lies about 5 miles north-north-westward of South-west point, and 1¾ miles offshore. Tan shin sha, with a depth of 3¾ fathoms (6m9) over it, and with a 3-fathom (5m5) patch about 2 miles northward, lies 11½ miles north-westward of the same point and over 7 miles offshore.

A shoal, with a depth of 18 feet (5m5) over it, was reported by the master of the Norwegian s.s. *Prosper*, in 1936, to lie westward of Kam yan sha (page 399), in a position about 19 miles westward of Kam yan koh (*Lat. 18° 53′ N., Long. 108° 37′ E.*).

A shoal, with a depth of 21 feet (6m4) over it, was reported, in 1937, by the master of the Danish s.s. *Gustav Diederichsen*, to lie about 13 miles westward of Kam yan koh. Shoal water farther westward was reported in 1935.

A patch, with a depth of 5 fathoms (9m1) over it, lies about 10 miles north-westward of Kam yan koh and 9 miles offshore. A shoal, with a depth of 2½ fathoms (4m6) over it, was reported, in 1930, to lie about half a mile north-westward of this patch.

When navigating along this coast vessels are recommended to keep in greater depths than 20 fathoms (36m6).

NORTH-WESTERN SIDE OF HAINAN ISLAND.—Coast.—From Bluff point the coast trends north-eastward for 15 miles to Hai t'ou (Hoitou), a fishing station in which there is a fort; the coast commences with a high sandy beach, which becomes low and darker coloured near the Saddle hills, 1,060 feet (323m1) high, which lie about 9 miles south-south-westward of Hai t'ou and about 3 miles inland.

On both sides of Hai t'ou the coast is foul; on the northern side, for a distance of 3 miles, the coastal reef extends three-quarters of a mile offshore and is fairly steep-to. The estuary of the river, on which Hai t'ou is situated, dries, with the exception of a small portion; the depths are subject to change and the estuary should not be entered without local knowledge.

Saddle hills are the best guide for approaching from any distance, being the only isolated coastal hills between Bluff point and Ping-ma point.

Hai t'ou may be identified by its white houses and the junks in the anchorage.

Charts 2661a, 1263.

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Chart 2062.

The coast from Hai t'ou trends north-north-eastward for 7 miles to Flat point, which is about 200 feet (61m0) high.

Anchorage.—There is anchorage off Hai t'ou with the fort bearing 114°, distant about 3 miles, in a depth of 7 fathoms (12m8).

Coast.—Danger.—Chappu bay is entered between Flat point and Cape Pillar, about 16 miles north-eastward; it is open to all westerly winds, but affords anchorage during the North-east monsoon.

Lin-ch'ang shih (Taan reef), with a sand cay, awash at high water near its south-western extremity, lies in the middle of the bay, about 3 miles off its south-eastern side, to which it is connected by a bank, over which there are depths of 4 fathoms (7m3).

The south-eastern side of Chappu bay is fringed by a drying bank of sand for a distance of 7 miles north-eastward of Flat point and by a bank, which extends nearly one mile offshore in places, for a distance of about 5 miles farther northward.

Chart 1019, plan of Hiong Po bay and entrance to Taan lagoon.

Hsin-ying chiang. — Dangers. — Beacons. — Hsin-ying chiang (Hiong Po bay), at the head of Chappu bay, is entered between Hiong Po point, situated about 4½ miles southward of Cape Pillar, and a point about 4½ miles farther southward. It is well sheltered and available for vessels of moderate draught.

Hiong Po point (*Lat. 19° 43' N., Long. 109° 10' E.*), on which are the ruins of Outer fort, is the extremity of a narrow peninsula consisting of low sand dunes covered with bushes. The southern side of the point is fringed by a reef and foul ground extends over one cable southward from this reef. A bank, which dries from 8 to 10 feet (2m4 to 3m0), on the western side of which is a reef, extends about one mile westward from Hiong Po point. A bank, with depths of less than 3 fathoms (5m5) over it, extends south-eastward from the southern side of the last-mentioned bank across the bay, forming a bar in the approach to the anchorage. Some sunken rocks lie in the south-eastern part of this bank, about 1¾ miles south-eastward of Hiong Po point and about 1½ miles off the eastern shore of the bay.

The south-eastern side of the above-mentioned peninsula is indented by two shallow bights, separated by a projection situated about 9 cables north-eastward of Hiong Po point; depths of 2¾ fathoms (5m0) extend nearly one cable from the projection.

A white pole beacon, surmounted by an inverted triangle, is situated on the peninsula about three-quarters of a mile north-eastward of Outer fort.

Leading beacons are situated at the northern end of the bay. The front beacon, consisting of a pole surmounted by a triangle, stands on the coast close eastward of Hiong Po. The rear beacon is a pole in a tall tree about 2 cables north-north-eastward of the front beacon. These beacons in line bear 030° and lead across the bar, in a depth of 2¼ fathoms (4m1).

Hiong Po, a fishing village, is situated on the northern side of the bay about 1¾ miles north-eastward of Hiong Po point. A reef lies close southward of Hiong Po.

Taan lagoon, which affords shelter from all winds to small vessels with local knowledge, is entered between Pai-ma-ching (Pak Ma Ching), a point situated about 1½ miles east-south-eastward of Hiong Po and a point on the mainland about 3 cables northward. On the

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Chart 1019, plan of Hiong Po bay and entrance to Taan lagoon.
southern side of the entrance are the ruins of South fort, which are inconspicuous and on the northern side, North fort, which is prominent.

A bank, which dries in places, extends nearly 1½ miles westward from the southern entrance point of Taan lagoon. A short distance eastward of the entrance the lagoon is encumbered with sandbanks.

Tan hsien (Taan) (chart 2062), a walled town, and one of the most important trading places in Hainan, is situated about 6 miles eastward of the entrance to the lagoon.

Anchorages.—Directions.—There is anchorage off Hiong Po, in depths of from 5 to 6 fathoms (9m1 to 11m0), sheltered by the bank which extends westward from the southern entrance point of Taan lagoon.

There is anchorage for small vessels in the position shown on the chart, in Taan lagoon about 3½ cables eastward of North fort, in depths of from 4 to 5 fathoms (7m3 to 9m1).

A vessel from north-westward should approach with Mount Ungo (*see* below), bearing 143°, which leads between Lin-ch'ang shih and the reef extending westward and south-westward from Hiong Po point. When the leading beacons are nearly in line course should be altered north-eastward, and the vessel should keep them in line, bearing 030°, which leads towards the anchorage.

The tidal streams run with considerable strength when the tidal range is large; the best time to enter the harbour would therefore appear to be towards low or high water, but vessels should not enter without local knowledge.

Chart 2062.

Coast.—Light.—Cape Pillar (*Lat. 19° 47' N., Long. 109° 09' E.*) is the extremity of a range of red bare hills, and has a peculiar columnar rock on it; a pagoda stands on the cape. Two islets, named Thumb and Mandarin's Cap, the latter being 56 feet (17m1) high, lie on the steep-to reef which fringes this part of the coast.

Chart 3892.

From Cape Pillar to Ping-ma point, about 11 miles north-eastward, the coast is low and sandy, and bordered with coconut trees; it is indented by three bays, each of which is fringed by a reef which extends about three-quarters of a mile offshore.

A light is exhibited on the cone about 2¾ miles south-westward of Ping-ma point.

Ping-ma point is a steep cliff surmounted by a hill with two peaks. Mount Ungo (chart 2062) lies about 18 miles east-south-eastward of Flat point (page 402); Ping-ma-shan, with two conical peaks, one of which is 692 feet (210m9) high, lies about 3½ miles southward of Ping-ma point. Kung Chin, a wooded conical hill, 646 feet (196m9) high, lies isolated in a plain, about 10 miles south-eastward of Ping-ma point, and 3¾ miles from the northern coast of Hainan island.

For continuation of the coast eastward, *see* page 421.

Chart 1019, plan of Gaalong bay.

SOUTH-EASTERN AND EASTERN SIDES OF HAINAN ISLAND. — Lang-Ya wan. — Beacons. — Lang-Ya wan (Gaalong bay) is entered between Pai-hu chiao (Cape Rhinoceros), a black rocky point, 556 feet (169m5) high, on which there are three beacons, situated 2¾ miles east-north-eastward of Chinmu chiao (page 394), and Lang-ya

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Chart 1019, plan of Gaalong bay.

chiao (Cape Gaalong), 159 feet (48m5) high, about 5½ miles east-north-eastward.

Tung-lang chow (East Brother), 362 feet (110m3) high, lies nearly one mile south-westward of Lang-ya chiao. A rock, 44 feet (13m4) high, lies close eastward of Tung-lang chow, and an islet, 34 feet (10m4) high, lies close off, and connected by, a reef to the north-western side. Three beacons stand on the southern extremity of the island. Hai-lang chow (West Brother), 342 feet (104m2) high, lies about three-quarters of a mile westward of Tung-lang chow; there are three beacons on its southern extremity.

Yeh-chu tao (St. Peter or Middle island), 310 feet (94m4) high, lies in the middle of the northern part of Lang-Ya wan, 1¾ miles north-north-westward of Hsi-lang chow, and 6 cables from the head of the bay. A reef, with a depth of 5 feet (1m5) over it, extends about one cable from the northern end of the island.

Tung-pai, 44 feet (13m4) high, and Hsi-pai, 21 feet (6m4) high, are rocky islets lying about one mile and 1½ miles, respectively, westward of Yeh-chu tao; a rock, awash, lies about one cable north-westward of Hsi-pai, and two rocks, which dry 5 and 3 feet (1m5 and 0m9), respectively, lie about 2 cables south-westward of the same islet. The western shore of the bay is reported to be foul.

Lang-ya chiang (Sampan Bay), about three-quarters of a mile wide at its entrance, is situated on the eastern side of Lang-ya wan. A reef extends about one cable from the south-eastern side of Lang-ya chiang. Lang-ya (Gaalong) village (*Lat. 18° 13′ N., Long. 109° 42′ E.*), consisting of bamboo huts, stands at the head of Lang-ya chiang.

Anchorages.—Directions.—The usual anchorage is off Lang-ya village, in depths of from 7 to 8 fathoms (12m8 to 14m6), sand and mud. In this position, the North-east monsoon blows strongly over the low neck of land between the hills on Lang-ya chiao and those farther inland. Southerly and south-westerly winds cause a considerable swell in the bay.

A small vessel might moor close under the northern side of Yeh-chu tao, in depths of from 4 to 5 fathoms (7m3 to 9m1), mud, where she would be sheltered from all winds; the depths were reported, prior to 1868, to decrease to 3 fathoms (5m5) half-way towards the northern shore of the bay, and the bottom is sandy.

The channels between the islands in the entrance are reported to be safe.

Chart 2062.

Ling shui wan.—Ling shui wan (Ling sui), which is exposed to the South-west monsoon, is entered between Lang-ya chiao and Ling shui chiao, about 21 miles north-eastward. For about 5 miles north-north-eastward from Lang-ya chiao, the western shore of the bay is indented by three bights, the northern of which is Tieh-lu chiang.

Niu-chi chow, 267 feet (81m4) high, lies about 7 miles north-north-eastward of Lang-ya chiao and about 1½ miles from the western shore of the bay. A rock, with a depth of 4 feet (1m2) over it, lies 8 cables east-south-eastward of the north-eastern extremity of the island. A spit, on which there are two rocks, above water, one of which is 31 feet (9m4) high, extends about 2 cables north-eastward from the north-eastern extremity of the island, and a spit, with a depth of

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Chart 2062.

1½ fathoms (2m7) over it, extends a quarter of a mile north-westward from the north-western extremity.

Black point, a small projection, lies about 4 miles north-north-eastward of Niu-chi chow. A shoal, which dries, and some sunken rocks lie about one mile south-westward of Black point.

Ling shui chiao rises to several high hummocks, with a sandy plain northward of them. A reef extends about half a mile southward from the point, and an islet, with a rock, on which the sea breaks, close southward, was reported, in 1893, to lie about 1½ miles northward of the point, and close offshore.

Sugar-loaf point lies about 3 miles west-south-westward of Ling shui chiao, with a hill of that shape over it. A shoal, with a depth of 4½ fathoms (7m8) over it, lies about 1½ miles south-westward of Sugar-loaf point, and several above-water and sunken rocks, which are steep-to, extend three-quarters of a mile from a point about 1½ miles west-north-westward of Sugar-loaf point.

About 1½ miles north-westward of Sugar-loaf point is a narrow passage which leads between two sandy points into a lagoon. There is a small fort on the north-western entrance point; the lagoon extends about 3 miles north-eastward. Shoal water extends about 1½ miles south-westward from the entrance. The lagoon can be entered by vessels with local knowledge, with a draught of 8 feet (2m4), but banks of coral and sand render its navigation difficult. In 1947, it was reported that there were two entrances into the lagoon.

There are two large villages on the shores of the lagoon and the town of Ling shui (*Lat. 18° 29′ N., Long. 110° 00′ E.*) is situated about 7 miles up the river of the same name, which flows into the head of the lagoon.

Northward of this lagoon rise the high Ling shui mountains. Table mountain lies about 9 miles west-north-westward of Ling shui chiao and 2 miles inland.

Off-lying dangers.—Dangers, the position of which is doubtful, are charted at distances of 6 and 12 miles, respectively, south-eastward of Ling shui chiao; the vessel *Daniel J. Richard* is reported to have touched on the inner one in 1872; breakers were reported, in 1890, by the French man-of-war *Turenne*, in the position of the other.

In 1948, an area of discoloured shoal water, about 3 miles in extent, was reported to exist in a position about 21½ miles eastward of Ling shui chiao.

Anchorage.—Vessels will be sheltered in Ling shui wan during the North-east monsoon period by anchoring with the fort on the north-western side of the entrance to the lagoon bearing 034°, distant about 3 miles, in depths of about 10 or 12 fathoms (18m3 or 21m9).

Coast.—Off-lying islets and danger.—Between Ling shui chiao and Malau tau or Green point, about 25 miles north-eastward, there is a bay, the shore of which consists of many sandy beaches and high land near the coast, but the bay affords no safe anchorage during the South-west monsoon. About 14 miles north-north-eastward of Ling shui chiao, and about 2 miles inland, are three prominent peaks of a range of mountains, the centre peak, Ang Hi, being the most pointed and a little higher than the others. About 18 miles farther inland, there is another mountain of similar appearance, but higher; this mountain has been seen from seaward at a distance of nearly 90 miles.

Charts 2661a, 1263.

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Chart 2062.

Malau tau, which rises to an elevation of 820 feet (249m9), is the southern extremity of a range of hills; a hill, 940 feet (286m5) high, lies about 5 miles north-north-westward of Ling shui chiao.

The coast is indented by Hau tau wan, about 10 miles north-north-eastward of Ling shui chiao, but it is too shallow to afford an anchorage.

Tien fung, 121 feet (36m9) high, one of a group of rocks and having the appearance of a junk, lies about 5 miles north-eastward of Ling shui chiao, and 3 miles offshore.

Breakers were reported, in 1931, by the S.S. *Benalder*, in a position about 19 miles east-north-eastward of Tien fung.

Fen-chieh chou (Saddle islet), 356 feet (105m8) high, with two hummocks on it, lies about 9 miles north-north-eastward of Tien fung and about one mile offshore; a rock, with a depth of less than 6 feet (1m8) over it, lies close north-eastward of Saddle islet.

Chia-ching tao (Middle islet), 260 feet (79m2) high, lies about 5½ miles north-eastward of Saddle islet and less than one mile offshore.

Chart 1019, plan of Nam hoi chun and Chue tau.

Chou-tzu tao (Nam king chau), an islet, 510 feet (155m4) high, lies about 4 miles eastward of Chia-ching tao, and 1¾ miles southward of Chue tau, the southern extremity of a small hilly peninsula, situated on the coast, 4 miles westward of Malau tau (*Lat. 18° 40′ N., Long. 110° 23′ E.*).

The entrance to Chue tau kong, an inlet leading to the village of Shing lau and the town of Mun chau, lies about one mile westward of Chue tau. There are two remarkable rocks at the entrance, and a bar over which the sea breaks.

Between Chue tau and Malau tau there is a bight, the north-western shore of which consists of two sandy beaches divided from one another, about midway, by two rocky headlands close together; the north-eastern shore of this bight is formed by the cliffs of the high land extending northward from Malau tau.

Off this part of the coast, in moderate weather, bamboos which support drift nets, may frequently be seen a considerable distance offshore.

Anchorages.—There is anchorage, during the North-east monsoon only, in the bight between Chue tau and Malau tau, about 2 miles north-eastward of Chou-tzu tao and from three-quarters of a mile to 2 miles offshore, in depths of from 6 to 9 fathoms (11m0 to 16m5). This is known as Nam hoi chun anchorage.

There is anchorage in the bight westward of Chue tau, in depths of from 2 to 3 fathoms (3m7 to 5m5).

Chart 2062.

Coast.—Off-lying islands.—Sifa point, close off which is a sunken rock, lies about 13 miles north-eastward of Malau tau. The coast between consists chiefly of sandy beaches, divided by two or three high rocky points; Baker hill, 390 feet (118m9) high, is situated near the coast about 6 miles north-north-eastward of Malau tau, and another hill, 494 feet (150m6) high, lies about 3½ miles westward of Sifa point.

Kan-che-ling (Round islet), 340 feet (103m6) high, lies about 3 miles west-south-westward of Sifa point and close offshore. A rock, awash, lies half a cable south-eastward of Kan-che-ling.

Ta-chou tao (Tai chau or Tinhosa island), consisting of two ridges united by a sandy isthmus, which partly covers, lies off this part of

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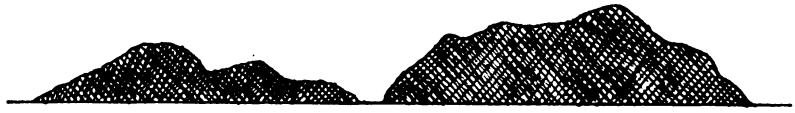
Chart 2062.

the coast about 5 miles eastward of Malau tau. The summit of the southern portion is 980 feet (298m7) high and that of the northern portion, 609 feet (185m6). Both portions are thickly wooded.



Ta-chou tao, bearing about 045°, distant 7 miles.
(*Original dated* 1923.)

Chart 1019, Plan of Tai chau or Tinhosa anchorages.

A detached sandbank, with depths of from 3½ to 5 fathoms (6m4 to 9m1) over it, lies from a quarter of a mile to 2 miles westward of the northern portion of the island. Vessels are recommended not to use the channel between this sandbank and the coast without local knowledge.

Anchorages.—There is sheltered anchorage between the two portions of Ta-chou tao, about 4 cables westward of the isthmus, in a depth of about 7 fathoms (12m8). This anchorage is known as West anchorage and is of importance as a refuge to low-powered steamers proceeding by this route from Singapore to Hong Kong when the North-east monsoon is blowing strongly. It affords a perfect lee and, with the exception of Ch'ing-Lan chiang (page 408), is the last anchorage before a vessel leaves the shelter of the coast en route for Hong Kong.

East anchorage, which affords shelter during the South-west monsoon, in depths of from 11 to 12 fathoms (20m1 to 21m9), is situated eastward of the isthmus.

Chart 2062.

Off-lying island and banks.—Kuan-ts'ai-ling (False Tinhosa) (*Lat. 18° 50' N., Long. 110° 34' E.*), an islet, 150 feet (45m7) high, lies about 2 miles north-eastward of Sifa point. From a northerly or southerly bearing, a pillar rock is visible at the eastern extremity of the islet. A rock, 10 feet (3m0) high, lies on the outer extremity of a ledge which extends a short distance north-north-westward from Kuan-ts'ai-ling. There is little or no shelter under this islet.

A shoal, with a depth of 6½ fathoms (11m9) over it, was reported, in 1927, by the *Daifuku maru* to lie about 12 miles eastward of Kuan-ts'ai-ling.

A bank, the existence of which is doubtful, was reported, prior to 1884, to lie about 5½ miles east-north-eastward of the same islet.

Coast.—The coast between Sifa point and Tungku point, 57 miles north-eastward, is low.

Twin Black rocks, the outer of which is 20 feet (6m1) high and the inner 30 feet (9m1), lie close together about 6 miles northward of Sifa point and less than one mile offshore. On the coast, abreast these rocks, is the mouth of a stream, with plantations of coconut trees. The country around is flat, with hills here and there.

About 16 miles northward of Sifa point, a bank, with depths of less than 6 fathoms (11m0) over it, and several rocks, which dry, extends nearly 1½ miles offshore; the outer danger is a rock, which dries 3 feet (0m9), lying about 1¼ miles offshore.

Charts 2661a, 1263.

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Chart 2062.

Pak ngo harbour lies about 19 miles northward of Sifa point. There is a prominent pagoda here and another at Ka chek, an important town about 9 miles north-westward of Pak ngo. There is an American mission station, with a hospital, at Ka chek.

A bank, with depths of less than 3 fathoms (5m5) over it, and several rocks which dry, extends about 6½ cables from the entrance to the harbour. A rock, 24 feet (7m3) high, lies about a quarter of a mile south-south-eastward of the entrance and 1½ cables offshore.

Between Pak ngo harbour and Tungku point, the coast is bordered with coconut groves, and is protected by a barrier reef, which lies from one to 3 miles offshore, having passages through it, opposite the mouths of streams.

These reefs consist of coral and are awash at half-tide, with depths of from 5 to 6 fathoms (9m1 to 11m0), close outside them.

This coast should not be approached within a depth of 15 fathoms (27m4).

Junks use the channel inside the barrier reef in smooth water. Fung ka, a small port, is situated about 19 miles north-north-eastward of Pak ngo. Anchorage may be obtained by vessels with local knowledge during the North-east monsoon southward of Fung ka, in a depth of 4 fathoms (7m3), sand, under the lee of the reef, which extends in the form of an elbow from the coast.

A rock was reported, in 1939, to lie about 4 miles south-south-eastward of Fung ka; its position, and the depth over it, are approximate.

Ch'ing-Lan chiang (Chun lan), at the mouth of the Wen Chang chiang, is entered about 9 miles north-north-eastward of Fung ka. The town of Wen Chang is situated about 10 miles inland from the mouth of the river.

Chart 1019, plan of Chun lan harbour.

Ch'ing-Lan chiang. — Dangers. — Buoys. — Beacons. — Ch'ing-Lan chiang is the only sheltered port between Yuling chiang and Nau chow (page 430), and is a good typhoon harbour for such craft as can cross the bar, over which there was, in 1947, a depth of 9 feet (2m7).

A vessel with a draught of 11 feet (3m4) has entered at half-tide, when the banks were visible on either side.

On the south-western side of the eastern entrance point there is a fort.

Two beacons, situated close westward of the fort, in line, bearing 000°, lead across the bar; in 1947, they were reported missing.

The western entrance point (*Lat. 19° 33′ N., Long. 110° 50′ E.*) lies about 1¼ miles north-westward of the fort. Reefs, on which the sea breaks, extend about 4 cables from the eastern entrance point, and 7½ cables from the western entrance point. A detached reef lies between these reefs, leaving a channel about 1¼ cables wide between it and the eastern entrance point, which is marked by black buoys on the western side and red buoys on the eastern side. In 1947, there was a black truncated conical buoy moored on the bar, 6¾ cables southward of the fort. A shoal, with a least depth of one foot (0m3) over it, lies 2½ cables eastward of the western entrance point.

The shore near the entrance is composed of a low sand ridge with coconut trees extending nearly to the water's edge. A pagoda, painted red, stands on the west bank of the river, 9 cables north-north-west-

Charts 2661a, 1263.

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Chart 1019, plan of Chun lan harbour.

ward of the western entrance point, and a pagoda, painted white, stands on the east bank, 3½ cables eastward of the red pagoda. The village of Ch'ing-lan-hsia is situated on the western bank, about 1½ miles from the western entrance point.

Anchorage.—Directions.—H.M.S. *Egeria* anchored off Ch'ing-Lan chiang, in 1875, with the fort at the eastern entrance bearing 327° and Tungku shan (chart 2062) bearing 052°, in a depth of 7 fathoms (12m8), hard sand.

There is a somewhat confined anchorage for small vessels in mid-channel about 3½ cables northward of the fort on the eastern side, in a depth of 3 fathoms (5m5).

The harbour should not be entered without local knowledge.

Coast.—There is a bight between the entrance of Ch'ing-Lan chiang and Tungku point.

Tungku point rises to Tungku shan, 1,120 feet (341m4) high, about 2½ miles north-north-westward, which is the summit of a range of hills from which three or four hillocks extend to the point. A group of rocks, one of which is 15 feet (4m6) high, extends half a mile eastward from the point; close southward of these rocks is the eastern end of the barrier reef, previously mentioned.

Tungku point, bearing about 293°, distant 14 miles.
(*Original dated* 1923.)

There is but little shelter under Tungku point in a strong North-east monsoon, at which time the swell is heavy along the whole of this part of the coast; rocks, just above water, lie in the most sheltered portion and in the bight westward there are many discoloured patches.

Outlying danger.—Lorne rock is a pinnacle, with a depth of 6 feet (1m8) over it, situated about 11 miles southward of Tungku point and the same distance offshore.

Caution.—The coast, in the vicinity of Tungku point, has not been accurately surveyed; uncharted reefs may exist. Vessels, therefore, proceeding along the land to avoid the strength of either monsoon, should exercise caution and should sound continuously. If standing northward by night, Tungku point should be given a wide berth, as there is usually a set towards the coast.

Chart 3892.

Coast.—Beacon.—The coast from Tungku point trends 23 miles in a northerly direction to Mofu point (*Lat. 20° 01′ N., Long. 110° 56′ E.*), the southern 10 miles of which have not been examined; northward of Tungku point for some distance the coast is reported to be low and sandy, beyond which it becomes elevated.

Mofu point, the north-eastern extremity of Hainan island, resembles Tungku point when seen from eastward. Mofu point is sandy and fringed by a reef which extends about one mile and is fairly steep-to. A white beacon, 33 feet (10m1) high, stands on the northern extremity of the point, near which there was, in 1881, a prominent conical tomb.

Charts 2062, 2661a, 1263.

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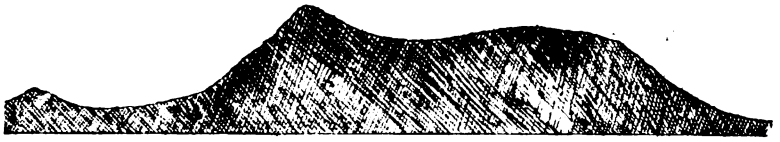
Chart 3892.

Mofu hill, a double-peaked black hill, 655 feet (199m6) high, lies about 4½ miles south-westward of Mofu point.



Mofu hill, bearing 180°, distant 6 miles.
(*Original dated* 1923.)

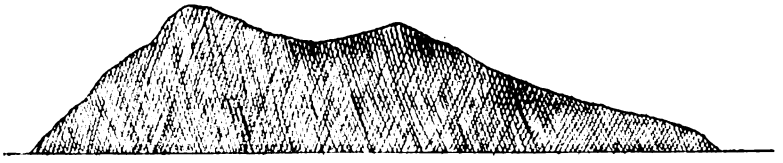
Owing to the prevailing thick weather during the North-east monsoon, Mofu point is frequently difficult to distinguish by vessels making it from north-eastward. The hills westward of the point consist of reddish soil, whilst those southward of the point are higher and covered with black patches.

Dangers.—For the obstruction northward of Mofu point, *see* page 413.

In 1941, a reef, with a depth of less than 19 feet (5m8) over it, was reported to extend about 2 miles around a position about 7¼ miles south-eastward of Mofu point.

Outlying islands.—Anchorage.—Taya islands, consisting of two groups of high, almost inaccessible, barren islands, are separated from the north-eastern end of Hainan island by a channel 12½ miles wide.

The north-eastern group consists of four islands. North Taya, 648 feet (197m5) high, the largest, lies about 19 miles eastward of Mofu point. From northward, the outline of North Taya resembles that of Mofu hill.



North Taya, bearing 208°, distant 15 miles.
(*Original dated* 1923.)

Perforated island (*Lat. 19° 58′ N., Long. 111° 15′ E.*), 375 feet (114m3) high, lies about half a mile south-south-westward of North Taya, with sunken rocks between. A conical island of the same elevation lies close south-westward of Perforated island ; sunken rocks lie close southward of both these islands. The south-westernmost island of this group, 388 feet (118m3) high, lies about 1¼ miles south-westward of North Taya.

The northernmost of the south-western group of islands, 175 feet (53m3) high, lies about 5 miles south-westward of North Taya. The largest island of this group, situated about three-quarters of a mile southward of the northernmost, has three peaks, the highest of which has an elevation of 456 feet (139m0) ; an islet lies close eastward, and a sunken rock lies close northward of the northern end of this island.

South Taya, 276 feet (84m1) high, lies about 1¼ miles south-south-

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View, in two parts, of the Taya islands from eastward.

(*Original dated* 1876.)

Hainan bluff, bearing 100°, distant 5 miles.

(*Original dated* 1923.)

P'u-ch'ien shan pagoda, bearing 110°, distant about 8 miles.

(*Original dated* 1923.)

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Chart 3892.

eastward of the largest island of this group, and has the appearance of two islets when seen from northward, eastward or south-westward; there is a sunken rock off its northern side. *See* views facing this page.

Temporary anchorage may be obtained about one mile south-westward of North Taya, in a depth of 20 fathoms (36m6), mud, but a swell rolls round the island during the North-east monsoon.

HAINAN STRAIT.—General description.—Hainan strait lies between Hainan island and the Lui-chow peninsula; it is about 10 miles wide in its narrowest part. The strait is entered from eastward between Mofu point (page 409) and Gopai point (*Lat. 20° 28′ N., Long. 110° 32′ E.*), about 36 miles north-westward. Numerous sandbanks exist in the approach from eastward extending for as much as 20 miles north-eastward of the line joining the entrance points. The sea generally breaks on these sandbanks during the North-east monsoon or when there is an easterly swell.

There are three main deep channels between the sandbanks in the eastern approach, named Pei shui tao (North), Chung shui tao (Middle) and Nan shui tao (South) channels.

The tidal streams in these channels are uncertain and only Chung shui tao should be used at night.

Ovans channel, on the north-western side of the eastern entrance to Hainan strait, is an inshore channel available for shallow draught vessels with local knowledge; it runs between the south-eastern side of the Lui-chow peninsula and Lo tao sha, situated about 6 miles south-eastward of Gopai point.

On the southern side of the strait, a short distance within the entrance, Little bank lies about 3 miles north-westward of Hainan head, the northern extremity of Hainan island. Westward of this bank, both sides of the strait are indented by shallow bays, which are generally fronted by shoals; between these shoals the strait is deep and clear of danger.

There are a few isolated banks in the western approach to the strait.

Tidal streams.—*See* page 424.

Eastern approaches. — Banks and channels. — Buoyage. — North-east bank, with a depth of 34 feet (10m4) over it, is the outermost of the banks lying in the eastern approach to Hainan strait, and is situated about 25 miles eastward of Gopai point.

North bank lies with its eastern end about 5 miles southward of North-east bank, and extends about 9 miles west-south-westward, with depths of less than 5 fathoms (9m1). On the northern side of the bank about 2½ miles from its western extremity, is a rock, with a depth of less than 6 feet (1m8) over it, and depths of less than 6 feet (1m8) extend about half a mile north-westward and south-eastward from the rock. A 16-foot (4m9) patch and a 17-foot (5m2) patch lie about 3¾ miles eastward and 5½ miles east-north-eastward, respectively, of the rock.

Breakers were reported, in 1914, in a position about 3 miles south-eastward of the rock on North bank, mentioned above. Shoal water was reported, in 1938, between this position and a position about 3½ miles south-westward, where there is a depth of 15 feet (4m6). The north-eastern end of this shoal area is marked by a conical light-

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Chart 3892.

buoy, painted red, and the south-western end by a conical light-buoy, painted red and exhibiting a *white fixed* light, moored on the south-eastern side of the 15-foot (4m6) shoal.

Seal bank, with a least depth of 16 feet (4m9) over it, lies about 14 miles east-south-eastward of Gopai point; there are shoals, with depths of from 3 to 18 feet (0m9 to 5m5) over them, lying from 3 to 6 miles northward of Seal bank.

West bank, on which are several patches, with depths of 3 feet (0m9) over them, lies about 7 miles south-westward of Seal bank and the same distance northward of Hainan head.

A light-buoy is moored about three-quarters of a mile off the southern side of the western end of West bank.

South banks, two groups of shoal heads, separated by a deep channel, lie about 9 and 12 miles, respectively, north-north-westward of Mofu point. The western end of the northern group lies about 6 miles offshore and the southern group is connected with Hai-nan-t'ou tui (page 414). The depths over the northern group are from 10 to 18 feet (3m0 to 5m5) and those over the southern group are from 13 to 18 feet (4m0 to 5m5).

A light-and-whistle-buoy, "A," painted black and exhibiting a *white flashing* light *every four seconds*, is moored about one mile east-north-eastward of the eastern of the northern group of South banks, as defined by the 10-fathom (18m3) line.

Pei shui tao (North channel) lies between Seal bank on its north-western side and North-east bank, North bank, and West bank on its south-eastern side. This channel is not straight and is not recommended when approaching Hainan strait from north-eastward.

Chung shui tao (Middle channel) is entered from eastward between North and South banks, and passes southward of West bank. This channel is the widest, deepest, and best approach to Hainan strait from north-eastward in clear weather, when settled conditions obtain. *Charts 3010, plan of Inner passage and approaches, 3892.*

Nan shui tao (South channel) is entered from eastward between Mofu point (*Lat. 20° 01′ N., Long. 110° 56′ E.*) and the eastern end of South banks and trends in a north-westerly direction between the southern portion of South banks and the north-eastern coast of Hainan island. At its north-western end, South channel leads into Inner passage (*see* page 413) and is the one chiefly used; it is buoyed at its north-western end and should always be taken in thick weather.

Southern side of strait.—Coast.—Between Mofu point and Hai-nan point, the north-eastern extremity of Hainan head, about 16 miles north-westward, there is a bay, the sandy shores of which are backed by sandhills, from 30 to 70 feet (9m1 to 21m3) high. A hill, 200 feet (61m0) high, appearing as a short black line above the sandhills of the coast, lies about 5 miles southward of Hainan point, and is a useful mark when approaching Nan shui tao from eastward. A hill, 166 feet (50m6) high, with a conspicuous white sand cliff, lies about 1½ miles south-south-eastward of Hainan point. The bay, mentioned above, is divided about midway into two parts by a small sandy projection, 89 feet (27m1) high; the eastern half of the eastern part of the bay is fringed by a reef, which extends one mile offshore at its western end, and the western half by a sandbank, which dries, and extends nearly one mile offshore at its eastern end; a bank, with depths of 3 fathoms

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Charts 3010, plan of Inner passage and approaches, 3892.

(5m5) and less over it, extends about three-quarters of a mile outside the reef and sandbank in this part of the bay.

The part of the bay lying north-westward of this projection is described with Inner passage.

Chart 3010, plan of Inner passage and approaches.

Inner passage. — Dangers. — Buoyage. — Beacon. — Inner passage, a continuation north-westward of Nan shui tao, lies between Hainan point and the south-western side of Hai-nan-t'ou tui (Hainan head bank), which is a continuation of the southern portion of South banks, about 1½ miles east-north-eastward. Several dangers lie on either side of the approach to Inner passage, and in 1939, the depths in the fairway were reported to be considerably less than is indicated on the chart.

Chart 3892.

An obstruction was reported by s.s. *Rosalie Moller*, in 1936, to lie about 2½ miles northward of the beacon on Mofu point.

An obstruction was reported, in 1949, to lie 7 miles west-north-westward of Mofu point, and about 3 miles offshore.

Chart 3010, plan of Inner passage and approaches.

On the south-western side of the approach, a vessel with a draught of 13 feet (4m0), was reported, in 1924, to have struck a submerged obstruction about 7 miles south-eastward of Hainan point, and 3 miles offshore.

Magpie rock, a pinnacle, with a depth of 3 feet (0m9) over it, lies about 1¾ miles south-south-eastward of Hainan point, near the extremity of a shallow spit which extends about half a mile offshore.

A detached shoal on the western side of Nan shui tao, with depths of from 6 to 15 feet (1m8 to 4m6) over it, extends about 2½ miles south-south-eastward from near the southern side of the above spit and from half a mile to 2 miles offshore ; a rock awash lies on the northern part of this shoal about half a mile south-eastward of Magpie rock, and close off the south-eastern extremity of the shoal there is a 16-foot (4m9) patch. Depths of less than 36 feet (11m0) extend about 8 cables north-eastward of the south-eastern part of the shoal ; Entrance buoy, a conical buoy, surmounted by a cylinder, is moored about 8 cables northward of the 16-foot (4m9) patch.

Riversdale patch, a rock with a depth of 15 feet (4m6) over it, lies about 4 cables north-eastward of Magpie rock ; a black conical buoy, surmounted by a cone, point up, is moored about 5 cables north-north-westward of this patch.

Between Magpie rock and Hainan point (*Lat. 20° 10' N., Long. 110° 41' E.*) the coast is fringed by foul ground, and a rocky spit, partly awash, extends north-eastward from the shore with its outer extremity about 6 cables south-eastward of Hainan point.

A reef, the outer end of which dries 4 feet (1m2), extends about half a mile northward from Hainan point ; a black steel cylindrical beacon on a concrete base, 12 feet (3m7) in height, stands near the northern extremity of this reef.

Hai-nan-t'ou tui (Hainan head bank) lies on the north-eastern side of Nan shui tao and Inner passage. This dangerous bank consists of a group of several parallel shoals, with depths of less than 18 feet (5m5) over them ; on the shoals there are extensive areas of rock and sand, with depths of less than 6 feet (1m8) over them. Drying sand cays,

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Chart 3010, plan of Inner passage and approaches.

and others awash at low water, lie on these shoals; their positions can best be seen from the chart.

The south-western side of Hai-nan-t'ou tui is steep-to and, farther north-westward, within the 10-fathom (18m3) line, there are numerous detached and scattered dangers, with depths of 18 feet (5m5) and thereabouts over them; a 23-foot (7m0) patch, the westernmost of these dangers, lies in the narrowest part of Inner passage; a red conical buoy, surmounted by a cone, point down, is moored about 5 cables east-northeastward of the beacon which stands near the extremity of the reef northward of Hainan point.

A 17-foot (5m2) patch was reported, in 1949, to lie on the 10-fathom (18m3) line, about 8 cables north-eastward of the same beacon.

Hainan head lies at the northern end of Hainan island; its summit, 192 feet (58m5) high, lies about one mile southward of Hainan point. The head is composed chiefly of sand and is covered with short scrub almost to the water's edge, which continues for about one mile south-eastward, where vegetation ceases, except for a few isolated patches. Hainan bluff, the north-western extremity of Hainan head, is a prominent flat-topped mound, 182 feet (55m5) high. *See* view facing page 411.

Charts 3010, plan of Inner passage and approaches, 3892.

Little bank lies in the north-western approach to Inner passage. The shoalest part of this bank, with a depth of 8 feet (2m4), rock, over it, lies about 4½ miles west-north-westward of Hainan point, and is marked on its northern side by "D" conical light-buoy, exhibiting a *green flashing* light *every fifteen seconds*.

About half a mile west-north-westward of the 8-foot (2m4) patch on Little bank there is a detached shoal, with a depth of 18 feet (5m5) over it, and 1¼ miles eastward of the same patch there is another detached shoal, with a depth of 13 feet (4m0) over it.

A shoal, the position of which is approximate, with a depth of 16 feet (4m9) over it, was reported by s.s. *Rio Blanco*, in 1937, to lie near the south-western end of Little bank, about 5 miles west-north-westward of Hainan bluff.

Caution.—Vessels should not approach the beacon on Hainan point (*Lat. 20° 10′ N., Long. 110° 41′ E.*) within a distance of 2½ cables owing to the existence of outlying rocky patches.

There are some stone beacons on Hainan head for use in maintaining the adjacent buoyage in position, but the buoys are not to be relied upon.

Anchorage.—There is anchorage in the south-eastern approach to Inner passage about 5 miles south-eastward of Hainan head, and 2 miles offshore, in a depth of 8 fathoms (14m6), mud and sand. This anchorage is slightly protected by Hai'nan-t'ou tui.

Directions for Inner passage are given on page 426.

Coast.—There is a small bight between Hainan point and Hainan bluff. The bottom is foul and rocky for about 6 cables north-north-westward and 4 cables south-westward of Hainan bluff. A rock, 7 feet (2m1) high, with a rock, 2 feet (0m6) high, 2 cables northward of it, lies about 2 cables westward of the bluff.

Mu-lan chiang (Hainan bay) is entered between Hainan bluff and a point about 5 miles south-westward. The shore of the bay consists of sand, backed by sandhills, from 50 to 70 feet (15m2 to 21m3) high, and covered with scrub with a few trees. The bay is foul to the distance of

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Charts 3010, plan of Inner passage and approaches, 3892.

about three-quarters of a mile offshore, with rocks above water in places. A shoal, with a depth of 29 feet (8m8) over it, lies in the middle of the bay, about 3 miles west-south-westward of the bluff.

Mu-lan chiang affords anchorage about 8 cables south-westward of Hainan bluff, in a depth of 7 fathoms (12m8).

Between the south-western entrance point of Mu-lan chiang and P'u-ch'ien chiao (Pochin point), about 1½ miles south-westward, there is a shallow bight, the shores of which are fringed by a narrow reef.

P'u-ch'ien chiao is composed of sand. A reef, near the extremity of which is a rock, 10 feet (3m0) high, extends about half a mile westward from the point; the western side of this reef is steep-to, but from its northern side, a spit, with a depth of less than 6 feet (1m8) over it, near its extremity, extends nearly one mile north-north-eastward.

P'u-ch'ien shan (Pochin hill), about 1½ miles eastward of P'u-ch'ien chiao, has seven peaks, but more than four are seldom visible at the same time; the highest, on which there is a conspicuous pagoda, has an elevation of 459 feet (139m9). *See* view facing page 411.

Chart 3892.

P'u-ch'ien wan.—Banks.—Buoy.—P'u-ch'ien wan (Pochin bay) is entered between P'u ch'ien chiao and Pai-sha chiao (Baksha point), about 13 miles westward and affords good anchorage.

The eastern side of the bay from a point about one mile southward of P'u-ch'ien chiao to the eastern entrance point of P'u-ch'ien-hsien hu (Pochin lagoon), 2½ miles farther southward, where there is a fort, is fringed by a reef which extends about three-quarters of a mile offshore, and on which are some rocks, from 3 to 4 feet (0m9 to 1m2) high. A red buoy, surmounted by a black triangle, is moored about 3½ miles south-westward of the pagoda on P'u-ch'ien shan and about one mile from the outer edge of this reef.

The western entrance of P'u-ch'ien-hsien hu lies about 1½ miles west-south-westward of the eastern entrance, with an island, on which are some bushes, midway between. A bank, which dries from one to 3 feet (0m3 to 0m9), lies close northward of this island, and depths of less than 6 feet (1m8) extend nearly 2 miles from the entrance to the lagoon, forming a bar.

Westward of P'u-ch'ien-hsien hu, the south-western side of P'u-ch'ien wan, is low and sandy, intersected by creeks, and backed by trees from 1½ to 2 miles inland. The mouth of Pei chang ch'i (Pochin river), which apparently dries, is situated about 2 miles eastward of Pai-sha chiao (*Lat. 20° 05′ N., Long. 110° 20′ E.*).

Baksha banks extend 9½ miles east-north-eastward from Pai-sha chiao, or about half-way across the entrance to P'u-ch'ien wan. About midway, a portion of these banks dries one foot (0m3), and about one mile within the eastern extremity there is a depth of only one foot (0m3). The western part of the banks may be crossed in a depth of 15 feet (4m6), about 3 miles east-north-eastward of Pai-sha chiao.

Between Baksha banks and the shore bank extending from the head of P'u-ch'ien wan the depths are irregular. There are usually numerous fishing stakes on the banks in P'u-ch'ien wan, and, in 1939, they were also reported 2 miles northward of Baksha banks.

Anchorages.—Directions.—There is anchorage 1½ miles westward of P'u-ch'ien chiao, in a depth of 6 fathoms (11m0), sand and mud, with good holding ground. There is also anchorage for small vessels in the

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Chart 3892.

approach to P'u-ch'ien-hsien hu, about 3 miles south-westward of P'u-ch'ien chiao, in a depth of 3 fathoms (5m5). These anchorages are exposed to northerly winds which soon raise a sea.

The best anchorage in bad weather is in Kiungchow roads, about 2 miles offshore, with the pagoda on P'u-ch'ien shan bearing 088°, distant about 9 miles, and Chiung chow pagoda, 226°, in a depth of 4½ fathoms (8m2), stiff mud. H.M.S. *Magpie* rode out a typhoon, in 1880, at this anchorage, being protected by Baksha banks.

This anchorage should be approached from eastward; the entrance from westward is only available for vessels with local knowledge.

P'u-chien-hsien hu.—The bar, in the approach to P'u-chien-hsien hu had, in 1946, a depth of about 10 feet (3m0) over it at high water; small vessels with local knowledge can then enter the lagoon. About half a mile southward of the fort on the eastern side there is a village, abreast which there are depths of about 2 fathoms (3m7). Within the lagoon the depths are less. About 2½ miles southward of the fort is a conspicuous red cliff.

Charts 37, 3892.

Hoihow bay. — Dangers. — Lights. — Light-buoy. — Hoihow bay, also known as Hai-Kou, is entered between Pai-sha chiao and Cheng-mai chiao (Ching mae point), about 10 miles westward. Nearly midway between the entrance points there are some red cliffs, with barren sandhills, from 70 to 80 feet (21m3 to 24m4) high, on the eastern side. The Hummocks, two extinct craters, about a quarter of a mile apart, lie about 8½ miles south-south-eastward of Cheng-mai chiao; the northern crater is 564 feet (171m9) high, and the southern is 705 feet (214m9).

Pai-sha chiao (*Lat. 20° 05′ N., Long. 110° 20′ E.*) is low and sandy with occasional hillocks and patches of green scrub. Fishing stakes, covered at high water, extend 2 miles north-north-eastward from the point. Pai-sha-men (Baksha village) is situated about 1¼ miles south-south-westward of Pai-sha chiao, and about the same distance within the outer edge of the sand and mud banks which lie off the south-eastern side of Hoihow bay. These banks are almost covered at high water, and are intersected by shallow channels leading to Pai-sha-men and Hoihow; the banks are subject to change.

There are two whitewashed forts, one on either side of the entrance of Hai-kou chiang (Hoihow river), the south-western of which is Fort A, situated about 2½ miles south-south-westward of Pai-sha chiao. A high, grey stone building, with a small red brick structure on its roof, and situated about half a mile southward of Fort A, is prominent from seaward. Radio masts are situated about 11½ cables south-eastward of Fort A, and also nearly 2 miles south-south-eastward of the same place. An obelisk, with a fort about 3 cables south-south-eastward, stands on the coast at the south-western end of the above-mentioned banks, about 2 miles south-westward of Fort A. There is a conspicuous tree about 4 cables south-eastward of the obelisk. Chiung chow (Kiung chow) pagoda, 154 feet (46m9) high, and prominent, is situated about 3¾ miles eastward of the obelisk; the pagoda is obscured by trees for some distance eastward of Pai-sha chiao.

A light is exhibited, at an elevation of 73 feet (22m3), from a white circular tower, 22 feet (6m7) in height, on the southern shore of Hoihow bay. The lighthouse is not conspicuous, as it stands in front of a

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Charts 37, 3892.

low white building which is, however, easily seen. *See* view facing page 60.

A light is exhibited, at an elevation of 50 feet (15m2), from a white mast on Fort A. *See* view facing page 60.

Two T-headed piers, protected by a detached breakwater, project from the coast nearly 1½ miles westward of the obelisk; the Harbour office is situated at the root of the western, and smaller, pier. There is a conspicuous tree about 6½ cables south-eastward of the lighthouse. Radio masts and a conspicuous house stand 1½ cables westward and 5½ cables west-north-westward, respectively, of the lighthouse.

The southern and south-western sides of Hoihow bay, between the obelisk and a point about 6½ miles west-north-westward, are fringed by a narrow drying bank. Two rocks awash lie about 1½ cables offshore, about one mile and 1¼ miles east-south-eastward of the point; there are fishing stakes over three-quarters of a mile north-north-westward of this point, and, between the point and Cheng-mai chiao, about 2½ miles westward, there are several small bays, the entrance points of which are foul.

Mandarin cap, a conspicuous conical mound, 83 feet (25m3) high, about 1¼ miles eastward of Cheng-mae chiao, and half a mile inland, is situated at the north-western extremity of the range of sandhills on the north-western side of Hoihow bay.

Cheng-mai chiao is low and sandy, with a sunken rock close off it, northward and westward of which a bank, with depths of less than 3 fathoms (5m5) over it, extends nearly one mile. This point should be given a wide berth, especially at night.

Chart 37.

A shoal, with depths of from 27 to 30 feet (8m2 to 9m1) over it, lies about three-quarters of a mile north-westward of Pai-sha (Baksha) entrance and about 1¾ miles west-north-westward of Pai-sha chiao (*Lat. 20° 05′ N., Long. 110° 20′ E.*).

Practically the whole of Hoihow bay is encumbered by an area of shoal water with depths of less than 18 feet (5m5) over it, and near the head of the bay the depths are considerably less.

Dale bank, situated at the north-western end of the above shoal area, with depths of less than 12 feet (3m7) over it, is about 2½ miles in length and, near its north-western extremity, about 2½ miles north-eastward of Mandarin cap, there are two shoals, about 2 cables apart, with depths of 3 and 4 feet (0m9 and 1m2) over them.

A conical light-buoy, painted red and exhibiting a *white flashing* light *every twenty seconds*, is moored about 2 cables northward of the 3-foot (0m9) shoal, the outer of the two shoals above described.

Cable area.—A cable area, about 2 cables in width, extends along the western side of Hoihow bay from near the western entrance point to a position close westward of the piers at the head of the bay; the limits of the area are indicated by pecked lines on the chart.

Tidal streams.—The tidal stream sets north-eastward for about 8 hours and south-westward for about 16 hours, at rates of from 1½ to 2 knots.

For tidal streams in the fairway of Hainan strait, *see* page 424.

Anchorages.—Harbour limits.—The anchorage for vessels, other than native craft, in depths of less than 5 fathoms (9m1), lies within the limits of the harbour area which are defined by a line drawn in a

Charts 2062, 2661a, 1263.

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Chart 37.

316° direction from the obelisk, and a line drawn in a 260° direction from Pai-sha chiao; these limits are indicated by pecked lines on the chart.

The depths in these anchorages appear to be greater than indicated on the chart.

Junks and other small craft usually anchor in the southern entrance of Hai-kou chiang, about 1½ miles north-eastward of the lighthouse on the southern shore, in a depth of 10 feet (3m0).

These anchorages are partially protected by the sand and mud banks which extend from the south-eastern shore, especially the anchorage for small vessels, but they are open to winds between west and north-east. A heavy and confused sea is felt at times but the holding ground is reported to be good and is composed of a mixture of mud and sand.

Pilots.—Pilotage is compulsory for all merchant vessels entering Hoihow harbour. Pilots will meet vessels outside the harbour limits in a motor boat, painted white, displaying the International Code flag H.

Harbour regulations.—The following information is extracted from the harbour regulations:—

No vessels, except men-of-war, may use swinging booms. Swinging booms should be rigged in from sunset to sunrise.

Cargo boats are prohibited from boarding vessels until the Customs officer is on board. Masters of vessels should assist to their utmost the harbour authorities in having this rule observed.

All local harbour notifications and notices to mariners concerning the China coast may be seen at the Harbour master's office.

The following flags of the International Code of Signals are used for the following purposes: O, coolies wanted; C, Customs officer wanted; G, doctor wanted; B, explosives on board; Q, quarantine; NQ, fire on board.

Hai-kou chiang.—Light-floats.—The approach to the south entrance of Hai-kou chiang is described on page 416. The channel through the mudbanks leading to the entrance cannot be used except at high water, and then only by boats of shallow draught.

The channel between the mudbanks is marked by light-floats, numbered "1" to "17." No. 1 light-float is moored outside the entrance to the channel, nearly 1½ miles north-eastward of the light-house on the southern shore of Hoihow bay; the positions of the others, and the sides of the channel which they mark, can best be seen from the chart.

Within the forts at the entrance, both sides of the channel are formed by a succession of islands separated by creeks; the land is very low and flat in the vicinity.

The town of Hoihow, with a large number of native houses outside its walls, on its northern and north-western sides, is situated on the southern side of the river about three-quarters of a mile east-south-eastward of Fort A (*Lat. 20° 03′ N., Long. 110° 20′ E.*). There is a clock tower in Hoihow.

There is a bund, 600 feet (182m9) long, with a depth of about 3 feet (0m9) alongside, at Hoihow.

South-south-westward of Hoihow there are some ridges, from 40 to 50 feet (12m2 to 15m2) high.

Charts 3892, 2062, 2661a, 1263.

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Chart 37.

The walled city of Chiung chow (Kiungchow), the capital and the seat of government of Hainan island, is situated about 2 miles southward of Hoihow, on the western bank of a river which discharges into Hai-kou chiang about one mile eastward of that town.

In 1949, the population of Hoihow and Chiung chow were each about 50,000.

Boats with a draught of 2 feet (0m6) can proceed to Fa hi (page 393). There are wattle dams in places, which are opened for craft to pass through. The river rises from 6 to 8 feet (1m8 to 2m4) in the rainy season, but not more than 3 feet (0m9) can be depended on in the openings in the dams.

Hoihow.—Hoihow is the seaport of Chiung chow (*Lat. 20° 00′ N., Long. 110° 21′ E.*). The town is comparatively modern.

There are American and French missions in the town.

Trade.—The principal exports are eggs, sugar, leather, and grass cloth; the imports are piece goods, cotton yarn, flour, kerosene, matches and gasolene.

Port facilities.—Very small quantities of coal and fuel oil are obtainable.

Fresh provisions can be obtained, but notice is required.

During the North-east monsoon, owing to the swell, vessels are frequently unable to work cargo. Merchandise is unloaded into junks and sampans which can only enter Hai-kou chiang at high water.

There are three hospitals, belonging to the French, American and Chinese, respectively.

As regards health, Hoihow compares favourably with other parts of Hainan, though fever and ague prevail to some extent.

Communication.—Hoihow is connected with Chiung chow by telegraph and telephone; and there is a Chinese post office at the latter place.

There is occasional communication by steamer with other ports in China, and also with Singapore, Bangkok and Hong Kong.

Chart 3892.

Cheng-mae wan.—Danger.—Cheng-mae wan (Ching mae bay) is entered between Cheng-mae chiao and Magpie point, about 13 miles west-south-westward. The land is low around this bay, rising gradually towards the Hummocks (page 416); the country is cultivated and the coast is bordered with trees and bushes.

Between Cheng-mae chiao and Tong sui, on which stands a pagoda, about 8 miles south-westward, there is a bight, the coast of which is fringed by a bank, which extends about one mile offshore, with depths of less than 5 fathoms (9m1) over it; about 1½ miles eastward of Tong sui, a part of this bank, which dries 2 feet (0m6), extends over half a mile offshore. Fishing stakes, indicated on the chart, are situated in the northern part of this bight.

There is a village on the coast about half a mile south-south-westward of Cheng-mae chiao; it was reported, in 1879, to show as a conspicuous dark patch against the sandhills. The town of Cheng (Ching)-mae stands about 5 miles southward of Cheng-mae chiao and 1½ miles inland.

The south-western end, or head, of Cheng-mae wan, between Tong sui and Magpie point, is nearly all occupied by a sandbank, the shoalest

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Chart 3892.

part of which, with a depth of 4 feet (1m2) over it, lies about 2 miles eastward of Magpie point (*Lat. 20° 00′ N., Long. 109° 56′ E.*).

Shak ket long fort is situated on a small projection about 5 miles east-south-eastward of Magpie point; close southward of the fort is the entrance to a lagoon which extends some miles inland.

From the western entrance point of this lagoon to a point about 1½ miles south-south-eastward of Magpie point, the coast consists of sandhills, from 20 to 30 feet (6m1 to 9m1) high. Fah yung, a hill, 200 feet (61m0) high, lies on the eastern side of the lagoon about one mile south-south-eastward of Shak ket long fort. Tong sui mun, a solitary hill, 470 feet (143m3) high, lies about 3 miles east-south-eastward of Fah yung.

Anchorages.—There is good anchorage for vessels with local knowledge in the south-western part of Cheng-mae wan, with Shak ket long fort bearing 158°, distant about one mile, in a depth of 3½ fathoms (6m4) mud. There is also anchorage in the eastern part of the bay about three-quarters of a mile south-westward of the village near Cheng-mai chiao, in a depth of 4 fathoms (7m3), but the approach to this anchorage is somewhat obstructed by the fishing stakes, previously mentioned.

A typhoon has been ridden out in Cheng mae wan.

Coast.—Magpie point may be identified by a detached piece of cliff, 48 feet (14m6) high, lying close northward of it. Between Magpie point and Sad point, 3 miles westward, the coast consists of red cliffs, from 50 to 60 feet (15m2 to 18m3) high and steep-to; the black lava underlying the soil below these cliffs has the appearance of a high-water mark.

Ma-niao chiang.—Ma-niao chiang (Maniu harbour) is entered between Sad point and Hong pi kok, about 4 miles westward. An islet lies about a quarter of a mile westward of Sad point, on the outer end of a reef which fringes the eastern side of the harbour. The western side of the entrance is foul and shallow for one mile eastward of Hong pi kok. A shoal, with a depth of 3 fathoms (5m5) over it, lies about one mile eastward of Hong pi kok and half a mile offshore.

Pao yu (*Lat. 19° 58′ N., Long. 109° 52′ E.*), a small projection, lies about 1½ miles southward of Sad point. Within Pao yu, the depths in the harbour are less than 3 fathoms (5m5), and the head of the harbour dries for three-quarters of a mile offshore. A small fort stands at the head of the harbour, 1¾ miles south-south-westward of Pao yu. Near the fort is a creek. Hong pi kok is an island on the extremity of a reef which extends about half a mile offshore.

The land in the vicinity of Ma-niao chiang is low and cultivated.

Anchorages.—Good shelter from easterly winds will be found in Ma-niao chiang about half a mile north-north-westward of Pao yu, with the islet lying off Sad point bearing 021°, in a depth of 4 fathoms (7m3), blue clay. There is also good anchorage, during westerly winds, in the western part of the harbour in about the same depth.

It has been reported that Ma-niao chiang is not a good typhoon anchorage.

Coast.—Danger.—Light.—Between Hong pi kok and Linkow point, about 6 miles westward, there is a bay, the depths in which gradually decrease towards the shore. The eastern side of the bay is fringed by a reef, and an islet lies about one mile south-south-westward

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Chart 3892.

of Hong pi kok, about half a mile offshore. In the south-eastern corner of the bay, about one mile southward of this islet, there is a shallow harbour with a small fort on its western entrance point.

A light is exhibited, at an elevation of 60 feet (18m3), from an ironwork framework tower on piles, painted in white and red horizontal bands, and 67 feet (20m4) in height, about one cable within Linkow point.

Western cap, a small hill, 46 feet (14m0) high, lies near the coast about one mile south-eastward of Linkow point. Linkow hill, 614 feet (187m1) high, lies about 6½ miles south-westward of Linkow point, and has a summit that is somewhat flat with two small peaks.

Between Linkow point and a point about 8 miles west-south-westward, the coast is fringed by a drying reef, which extends about half a mile offshore and a bank, with depths of less than 3 fathoms (5m5) over it, extends nearly 1½ miles in places.

Shoal water was reported, in 1926, about 6½ miles west-north-westward of Linkow point, but, in 1939, the area was swept to a depth of 6 fathoms (11m0), as indicated on the chart.

This portion of the coast should be given a wide berth.

Hsin-ying-chiang. — Dangers. — Light. — Beacons. — Hsin-ying-chiang is entered between the point 8 miles west-south-westward of Linkow point and Ping-ma point (page 403), about 17 miles west-south-westward. The village of Hsin-hsing (Hau sui) stands on the eastern side of the bay, about 6 miles south-south-westward of its eastern entrance point. The south-eastern part of the bay is very shallow; Hau sui creek is entered in this part of the bay through a narrow channel almost dry at low water. Shallow draught vessels with local knowledge can enter this creek at high water and find good shelter, in depths of from 2 to 3 fathoms (3m7 to 5m5).

The western side of Hsin-ying-chiang is indented by two bays, the western of which is shallow and its entrance obstructed by a reef.

A light, privately maintained, is occasionally exhibited from a white square tower on the eastern side of Hsin-ying-chiang, about 6 cables north-north-westward of Hsin-hsing.

A hill, called Black Knob, is situated about 8½ miles south-south-eastward of the light-tower on the eastern side of the bay.

Kung Chin (*Lat. 19° 48′ N., Long. 109° 25′ E.*), a hill situated about 8½ miles south-westward of the light-tower on the eastern side of the bay, and Ping-ma-shan, about 3½ miles southward of Ping-ma point, are described on page 403.

Lin-ch'ang, a reef, which dries and is steep-to on its northern side, except for a 14-foot (4m3) patch about 2 cables off, occupies the middle of Hsin-ying-chiang, its eastern extremity lying about 2½ miles west-north-westward of the light-tower. A beacon stands near the edge of the reef near the eastern and western ends of the southern side; a detached reef, which dries, lies about 5 cables southward and a 17-foot (5m2) patch about one mile south-south-eastward, of the eastern beacon; a similar patch lies about 8 cables south-eastward of the western beacon. Chiang-chun-yin (Chung kwan yan), a low sand cay, lies close southward of the south-eastern side of the reef.

A reef, which dries, lies in the south-eastern part of the bay about 2 miles south-westward of the light-tower on the eastern side of the bay.

Charts 2062, 2661a, 1263.

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Chart 3892.

Anchorage.—Directions.—Good sheltered anchorage at all seasons may be obtained by small vessels with local knowledge about 1¼ miles south-westward of the beacon near the eastern end of the drying reef in the middle of the bay, in a depth of 4 fathoms (7m3), white sand. Junks anchor outside the entrance to Hau sui creek. The bay affords emergency anchorage during a typhoon.

To enter the bay from westward, a vessel should keep Black Knob, bearing about 132°, just open south-westward of a pagoda on the southern side of the bay about 7¾ miles north-westward of it; this channel has been swept to a depth of 20 feet (6m1), as indicated on the chart; when the beacon near the western end of the drying reef in the middle of the bay bears about 020°, she should alter course northward and steer for the anchorage. Entering from eastward, the vessel should steer for Kung Chin, bearing 214°, anchoring as requisite; if intending to anchor southward of the reef as above mentioned, she should alter course westward when the beacon near the eastern end of the reef bears about 338°, passing southward of the 17-foot (5m2) patch situated about one mile south-south-eastward of the beacon, and anchor as requisite.

Northern side of Hainan strait.—Dangers.—Gopai point (page 411) is low and backed by sandhills, from 70 to 80 feet (21m3 to 24m4) high; it is the eastern extremity of Lui chow peninsula.

Black rocks, which dry 4 feet (1m2) and are always visible, are situated about 1½ miles north-north-eastward of Gopai point. Gopai narrows, a channel, lies between Black rocks and a shoal, which dries in patches, about 3 miles eastward of Gopai point; there is a narrow boat channel across the latter shoal.

A 27-foot (8m2) patch lies about 2½ miles east-south-eastward of Gopai point.

A mound, 160 feet (48m8) high, lies about 3 miles south-south-westward of Gopai point, and about one mile within Peterson point. Between Peterson point (*Lat. 20° 26′ N., Long. 110° 31′ E.*) and False point, about 6½ miles south-westward, there are occasional sandhills and a few villages; the coast is fringed by a bank, with depths of less than 3 fathoms (5m5) over it, extending about one mile offshore in places; two detached reefs, with depths of 2 fathoms (3m7) and 4 feet (1m2) over them, lie about one mile and 1¾ miles, respectively, offshore about midway between the two points.

Lo tao sha, a sand cay, 6 feet (1m8) high, with Kan sha and San sha, other cays or banks, close northward and south-westward, lies about 6 miles south-eastward of Gopai point. They lie on a bank, with depths of 3 fathoms (5m5), or less, over it, which extends about 4 miles north-eastward and 2 miles south-westward from them. Bartley bank, with a depth of 3 feet (0m9) over it, lies close eastward of the north-eastern end of the shoal; about 4 miles east-north-eastward of Bartley bank is a shoal with a depth of 3 feet (0m9) over it, and there are other shoals in the vicinity which has been imperfectly surveyed.

Detached 3, 5 and 2½-fathom (5m5, 9m1 and 4m6) patches lie about 2 and 2¾ miles south-westward, and 2 miles south-south-westward, respectively, of the south-western sand cay of Lo tao sha.

The inshore passage which lies between Lo tao sha and the drying shoal eastward of Black rocks, is described on page 427.

Charts 2062, 2661a, 1263.

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Chart 3892.

Foul ground extends from 1½ to 1¾ miles from Hongham point, about 3½ miles south-westward of False point; fishing stakes extend nearly 2 miles from Hongham point.

Between Hongham point and P'ai-wei chiao, the eastern entrance point of Hai-an bay, about 7½ miles south-westward, the coast consists of sandhills, surmounted by patches of scrub; it has not been surveyed, but Hongham bay, which lies between the two last-mentioned points, affords anchorage during northerly winds to vessels with local knowledge, with the north-eastern entrance point bearing 068°, distant 1½ miles, in a depth of 7 fathoms (12m8).

Hai-an bay. — Light. — Anchorage. — Hai-an bay, which is shallow, is entered between P'ai-wei chiao and Palm point, about 6 miles westward; on P'ai-wei chiao is a conical mound, 80 feet (24m4) high, and close southward of the point is an islet, 4 feet (1m2) high.

Baksha village is situated near the head of a white sandy bay, about 1½ miles north-north-westward of P'ai-wei chiao.

Hai-an village stands near the middle of the head of Hai-an bay, with an inlet northward of it. On the southern entrance point of this inlet, there is a white fort.

Pakchong village and fort are situated on the western side of the bay.

Palm point (*Lat. 20° 15′ N., Long. 110° 11′ E.*) had, in 1881, several trees on it; a spit, with a depth of 9 feet (2m7) over it, extends about half a mile southward from the point. There are overfalls off the point.

A light, privately owned, is exhibited, occasionally, near the fort at Hai-an.

Good anchorage may be obtained in Hai-an bay with the white fort near Hai-an village bearing 338°, distant 1¾ miles, in a depth of 5 fathoms (9m1), mud.

Coast.—Off-lying dangers.—Between Palm point and Islet point, about 3½ miles westward, the coast is nearly all fringed by a reef, extending as much as half a mile offshore midway between the two points.

Several islets, one of which is 20 feet (6m1) high, lie a short distance south-westward of Islet point (*Lat. 20° 15′ N., Long. 110° 07′ E.*); a rock, with a depth of less than 6 feet (1m8) over it, lies south-westward of these islets and 2 miles from the point, near the outer edge of the coastal bank.

Three-fathom patch, consisting of coral, and with a depth of 3 fathoms (5m5) over it, lies about 3 miles south-westward of Islet point. There are heavy overfalls in the vicinity of this patch and vessels should not attempt to pass northward of it as there are other patches, with less depths over them, between it and the outer edge of the coastal bank.

Shenwen range, 510 feet (155m4) high, lies about 6 miles northward of Islet point, and is prominent from westward. Shenwen pagoda, 385 feet (117m3) high, stands on the south-eastern slope of this range.

Kami bay.—Light.—Dangers.—Kami bay, entered between Islet point and Cape Kami, 11½ miles westward, is fringed by a reef which extends from half a mile to 1¾ miles offshore. The bay is shallow and depths of less than 5 fathoms (9m1) extend about 5 miles from its head. The eastern part of the bay rises gradually to the Shenwen range, but

Charts 2062, 2661a, 1263.

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Chart 3892.

the western part is low, consisting of sandhills topped with bush, which become bare as Cape Kami is approached.

Cape Kami is the south-western extremity of a sandy islet, about 40 feet (12m2) high, situated about half a mile within the edge of the reef which extends nearly 2 miles southward from the mainland.

A light is exhibited, at an elevation of 67 feet (20m4), from a white iron framework tower, with a black band, 67 feet (20m4) in height, on the southern extremity of Cape Kami. *See* view facing page 61.

A rock, with a depth of 6 feet (1m8) over it, and steep-to on its southern side, lies on the southern extremity of the reef, about one mile south-south-westward of Cape Kami lighthouse. Considerable overfalls extend some distance southward of this rock. A detached 3-fathom (5m5) patch lies about 1¼ miles south-westward of the lighthouse. A 19-foot (5m8) patch and a shoal, with a depth of 28 feet (8m5) over it, lie about 1¾ miles south-south-eastward and 2¾ miles south-eastward, respectively, of the lighthouse.

Tong Chong bay.—Dangers.—Tong Chong, or Safe, bay lies on the south-western side of the Lui-chow peninsula, between Cape Kami and Nau sa point (page 391). The shores of the bay are level and cultivated, with sandy beaches in places, and groups of trees. The coast is fringed by a reef which extends about 3 cables offshore, and a bank, with depths of less than 5 fathoms (9m1) over it, extends from one to 1½ miles offshore.

A rock, with a depth of less than 6 feet (1m8) over it, lies about 4¾ miles northward of Cape Kami lighthouse and about one mile offshore.

In 1939, numerous fishing stakes were reported about 5 miles north-westward of Cape Kami (*Lat. 20° 14′ N., Long. 109° 55′ E.*).

An islet, on which are a few trees, lies about 2 miles south-eastward of Nau sa point and close offshore. There are a few villages on the coast eastward of this islet.

Anchorage.—Good anchorage may be obtained, with shelter from north-westerly winds, in the western part of Kami bay, with the lighthouse bearing 277°, distant 1½ miles, in a depth of 5 fathoms (9m1), mud; and from north-easterly winds, in the southern part of Tong Chong bay, with Cape Kami lighthouse bearing 128°, distant 1½ miles, in a depth of 9 fathoms (16m5), mud.

Western approach to Hainan strait.—Banks.—Several banks lie in the western approach to Hainan strait. The westernmost of these banks, with a least depth of 3 fathoms (5m5) over it, lies from 22 to 32 miles west-south-westward of Cape Kami and about 10 miles off the northern coast of Hainan island.

A bank of sand, with a least depth of 3 fathoms (5m5) over it, lies from 16 to 20 miles westward of Cape Kami, and another bank of sand, with a least depth of 5 fathoms (9m1) over it, lies about 12½ miles west-north-westward of the cape; a similar bank, with a least depth of 27 feet (8m2) over it, lies about 6½ miles westward of the cape.

Tidal streams.—In the fairway of Hainan strait, in every 24 hours, the tidal stream is east-going for about 8 hours, and west-going for about 16 hours throughout the year, at rates of from one to 2¼ knots, except for 2 or 3 days in a lunation, when the streams turn four times daily and their rates are only a knot or less.

Admiralty Tide and Tidal Stream Tables (Pacific ocean and adjacent

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Chart 3892.

seas) contain day to day predictions of :—the times of maximum rate of the tidal streams, their minimum rates and the times at which the tidal streams turn in Hainan strait.

When the stream is setting eastward in Hainan strait, it is flowing in a general easterly direction from the northern part of the Tongking gulf towards the China sea. The times in the tables above hold good from the eastern approaches to the strait as far west as Bach Long Vi (page 302) in Tongking gulf. In Hainan strait the streams are strongest off Hainan head (*Lat. 20° 10′ N., Long. 110° 41′ E.*), where the rates are about double those tabulated. Off Cape Kami and in the eastern approach channels the rates are probably somewhat greater than those tabulated. The streams follow the general direction of the channels when setting strongly ; at other times their direction is influenced by seasonal currents, towards the south during the North-east monsoon, and towards the north during the South-west monsoon.

During the west-going stream there is a strong set on to the reef extending from Hainan point, and a set into P'u-ch'ien wan (Pochin bay). In Hoihow bay the set is south-westward. A wide berth should be given to Cape Kami as the stream sets west-north-westward in its vicinity.

Overfalls and tide-rips exist throughout the strait, but particularly westward of Inner passage between Hainan head and Pai-sha chiao. These are smooth, oily patches, about 15 yards (13^{m}7) in diameter, with rough water round the edges, and appear not necessarily to be caused by inequalities in the bottom.

There are also patches of discoloured water, which usually consist of vegetable matter from the several rivers, and which have the appearance of shoals ; masters of vessels should satisfy themselves on this point by sounding continuously.

Visibility.—During the North-east monsoon, and especially from January to March, visibility in Hainan strait is poor ; with little warning it may be reduced to two miles, or less, by drizzle or mist. *See* also page 45.

Charts 3892, 2062.

DIRECTIONS.—From eastward.—A vessel approaching Hainan strait from north-eastward and before proceeding through Chung shui tao, should sight North Taya island and Mofu point. The course through the fairway of Chung shui tao is about 248° until abeam of the light-buoy marking the south-western end of the shoal water, reported in 1938, on the northern side of the channel, when the vessel should steer about 270°, passing between West bank and Little bank, and thence keep in mid-channel, unless bound for Hoihow.

Vessels proceeding to Pakhoi (page 387) should round Cape Kami at a distance of from 3 to 4 miles and avoid the banks which lie westward of it, mentioned on page 424. After passing these banks a vessel should haul up for Chai-une and, after sighting that island, pass westward of Wei-chou tao (page 390), before steering for Pakhoi.

Vessels bound for Haïphong should keep on the southern side of Hainan strait till abreast Hsin-ying-chiang (page 421), then steer for Bach Long Vi (page 302), and thence to Îles Norway. Easterly or westerly currents of considerable strength may be experienced on this

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Charts 3892, 2062.

track, but very little northerly or southerly set need be feared, unless the monsoon is very strong.

Charts 3010, plan of Inner passage and approaches, 3892.

Nan shui tao and Inner passage.—Approaching Hainan strait from north-eastward, before entering Nan shui tao (page 412), the Taya islands should be sighted, whence course may be shaped for Mofu hill, bearing not less than 215°. From a position about 4 miles north-north-eastward of Mofu point, the conspicuous pagoda on P'u-ch'ien shan should be steered for, bearing 272°, until Hainan point bears 302°, when that point should be steered for on that bearing.

Chart 3010, plan of Inner passage and approaches.

The last-mentioned course leads north-eastward of "Entrance" buoy and between Hai-nan-t'ou tui, on the north-eastern side, and the black conical buoy moored half a mile north-westward of Riversdale patch, on the south-western side. Vessels are recommended to alter course slightly westward while passing the steep-to south-western side of Hai-nan-t'ou tui, mentioned on page 413, and to alter course slightly northward while passing Riversdale patch, in order to give these dangers a wider berth.

When Hainan bluff (*Lat. 20° 09′ N., Long. 110° 40′ E.*), which can be seen over the land within Hainan point, bears 276°, or the 192-foot (58^{m}5) summit of Hainan head bears 268°, the vessel will be northward of Riversdale patch, and course can be shaped about 320° to pass south-westward of the 23-foot (7^{m}0) patch situated 8½ cables east-north-eastward of Hainan point, and of the red conical buoy, surmounted by an inverted cone, moored about half a mile north-north-westward of the patch; when the beacon on the reef northward of Hainan point is in line with Hainan bluff, bearing 222° course may be altered westward, passing southward of Little bank and northward of Baksha banks.

Charts 3010, plan of Inner passage and approaches, 3892.

In Inner passage, caution is necessary during the west-going tidal stream, as that stream sets strongly towards Hainan point reef, and, when westward of the meridian of Hainan bluff, the indraught into P'u-ch'ien wan must be allowed for.

The tidal stream also sets very strongly, from 4 to 5 knots at times, across the north-western entrance of Inner passage, rendering it advisable at times to pass eastward and northward of Little bank; a danger angle of 40° between Hainan bluff and P'u-ch'ien pagoda will carry the vessel round the bank well southward of West bank, whence course may be shaped westward through the fairway.

From westward.—Entering Hainan strait from westward, the best channel is between the south-westernmost of the banks in the approach (page 424) and the coast of Hainan island, giving the latter a berth of at least 4 miles and avoiding the shoal water, reported in 1926, about 6½ miles west-north-westward of Linkow, mentioned on page 421.

Proceeding eastward from Hainan strait, either Pei shui tao, Chung shui tao or Nan shui tao can be used, but Chung shui tao is the best in clear weather. If using Pei shui tao, the conspicuous pagoda on P'u-ch'ien shan (*Lat. 20° 06′ N., Long. 110° 36′ E.*), kept astern, bearing 223°, leads out through the channel, but it must be visible nearly 30 miles to ensure passing westward of North-east bank.

Charts 2661a, 1263.

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CHAPTER IX

SOUTH COAST OF CHINA—HAINAN STRAIT TO THE ENTRANCE TO THE CHU CHIANG

Chart 2062.

LUI-CHOW PENINSULA.—The Lui-chow peninsula lies between the parallels of 20° 13′ N., and 21° 25′ N., and was probably at one time joined to Hainan island. It is little known, and large portions of its coast are unsurveyed. Its surface is undulating, with numerous depressions. Along the coast are barren sand dunes and scattered fishing villages.

The peninsula is under the same administration as that of Hainan island (page 392). The population is very mixed.

Climate and weather.—*See* page 36.

Chart 3892.

Eastern side.—Inshore passage.—Light.—The southern entrance of an inshore passage, leading to Malu hau and Nau chow, lies between Lo tao sha (page 422) and the south-eastern side of Lui-chow peninsula. This passage is available for vessels with local knowledge with a draught of about 12 feet (3^m7). If awaiting a tide, vessels can anchor about one mile south-eastward of Black rocks (page 422), in a depth of about 5 fathoms (9^m1).

The passage passes close eastward of Black rocks, thence for about $8\frac{1}{2}$ miles it leads between sand flats, which dry in patches, or have depths of only 2 to 3 feet (0^m6 to 0^m9) over them, or from about 10 to 14 feet (3^m0 to 4^m3) at high water springs; thence it leads over a flat, in a depth of about 9 feet (2^m7) at low water towards the south-eastern entrance of Passe de la Surprise (page 429).

A branch of the inshore passage leads to the port of Malu hau (*Lat. 20° 34′ N., Long. 110° 29′ E.*), situated on the southern side of the mouth of a river of the same name, about 7 miles north-north-westward of Gopai point (page 411), and protected by a bar, over which there is a depth of 4 feet (1^m2).

Eastward of Malu hau there are extensive banks which have not been thoroughly surveyed.

Mount Kamlung, 900 feet (274^m3) high, lies about 16 miles north-westward of Malu hau and 9 miles inland.

A light is exhibited occasionally from an old fort at Malu hau.

Tidal streams.—In the inshore passage the tidal streams generally set north and south along the channel, but off the entrance to the Malu hau river, they set strongly across the channel on both sides, adding to the difficulty and danger of navigation. Where the tidal

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Chart 3892.

streams from the inshore passage meet those from Hainan strait, there are sometimes eddies which have the appearance of breakers.

The maximum rate of the tidal streams that has been observed is 2½ knots. *See* tidal streams at Nau chow (page 431) and also in Hainan strait (page 424).

Charts 3892, 2062.

Coast.—Between Malu hau and a white fort on a point, about 40 miles northward, there is a bight, a considerable portion of which is occupied by Tung-hai tao (Tan hai), an island lying close off its north-western shore; Nau chow lies close south-eastward of Tung-hai tao.

The southern portion of the bight is occupied by shallow banks with narrow channels between them. Northward of Tung-hai tao is Kuang chou wan (*see* below).

Northward of Malu hau, the coast trends in a north-north-westerly direction for 18 miles to Pointe des Bécassines and is fringed by banks which extend as much as 8 miles offshore, with depths of less than 3 fathoms (5^{m}5) over them, and some of which dry.

Rivière de Lui chow, which is navigable by vessels with local knowledge with a draught of 10 feet (3^{m}0), discharges northward of Pointe des Bécassines.

Chart 2062.

The coast between Pointe des Bécassines and Tuman fort, on the coast about 10 miles north-westward, is fringed by a bank, which dries, extending 2 miles offshore in places.

Sata hopeng, the south-western extremity of Tung-hai tao, lies about 2 miles south-eastward of Tuman fort. Nearly all the area between Pointe des Bécassines and the southern side of Tung-hai tao is encumbered by shoals, but there is a narrow channel through them, in which the least depth is about 3 feet (0^{m}9) and which leads westward and north-westward of Tung-hai tao into Kuang chou wan. This channel can only be used by small vessels with local knowledge.

Lui-chow.—Lui-chow (*Lat. 20° 54′ N., Long. 110° 05′ E.*) is the principal town in the peninsula; it lies about 5 miles south-westward of Tuman fort and about 1¼ miles inland from the northern bank of Lui-chow river.

The exports from Lui-chow consist of oil, bean cake, and matting for sails.

There is a French mission in the town.

Lui-chow is connected to the general telegraph system.

Charts 3486, 3349.

KUANG-CHOU WAN AND APPROACHES.—The bay and territory of Kuang-chou (Kwangchow) form part of the Chinese province of Kwangtung.

The territory consists of a narrow strip of land enclosing the extensive estuary of Wu-li-shan chiang (Matshé river) and includes Tung-hai tao and Nau chow, on the southern side of Kuang-chou wan and the Namsang islands which lie on the north-eastern side of the same bay.

The country is volcanic in origin, and undulating, with two dominating peaks, one, named Massif de la Surprise, 510 feet (155^{m}4) high, situated on the western side of Wu-li-shan chiang, about 5 miles west-south-westward of Hsi-Ying (Fort Bayard) and the other, Mont

Charts 2661a, 1263.

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Charts 3486, 3349.

Jacquelin, 356 feet (108m5) high, situated on the eastern side of Tung-hai tao.

The coasts are flat and muddy, with the exception of the eastern coasts of Tung-hai tao and the Namsang islands, where there are stretches of sandy beach, and the sides of Nau chow which are rocky.

The territory is under the administration of a Chinese Governor who resides at Hsi-ying.

Chart 3349.

Kuang-chou wan can be approached by several channels. Goulet de Kuang-chou, the main entrance, lies between the north-eastern end of Tung-hai tao and Ile des Aigrettes, about one mile northward. Passe de la Surprise leads southward of Nau chow and Tung-hai tao towards the inshore channel, running westward and north-westward of the latter, mentioned on page 428. Chenal Nord-Ouest (Nau chow North-west channel) leads between Nau chow and Tung-hai tao and connects Passe de la Surprise with the channel leading to the main entrance.

Passe de la Surprise.—Dangers.—Foul ground, consisting of numerous sandbanks with deep channels between them in places, extends from one to 5 miles off the south-eastern side of Nau chow. Within this area lie Grand Plateau, which dries 12 feet (3m7), and numerous other isolated reefs, which dry from one to 9 feet (0m3 to 2m7); the positions of these reefs can best be seen on the chart.

Passe de la Surprise is entered from south-eastward between the south-easternmost of the above-mentioned sandbanks and Banc Liou-tchan-sha (Liu chan sah), which has not been surveyed, but on which the sea always breaks, about 3 miles south-westward. The south-eastern end of Banc Timosa lies on the south-western side of Passe de la Surprise, about 3½ miles westward of Grand Plateau. Banc Timosa extends about 8 miles north-westward from its south-eastern end and there are depths of from 2 feet to 2½ fathoms (0m6 to 4m6) over the portions of its northern edge which have been surveyed.

On the north-eastern side of Passe de la Surprise, the southern side of Nau chow is fringed by a bank, which dries, extending 2 cables offshore, and with depths of less than 3 fathoms (5m5) about 6 cables. Two reefs, which dry 5 and 3 feet (1m5 and 0m9), respectively, lie about 1¼ miles south-westward of Pointe Sud-Est (South-east point), the south-eastern extremity of the island (*Lat. 20° 52′ N., Long. 110° 36′ E.*), and from 4 to 6 cables offshore. About 2 cables south-eastward of the outer of these two reefs, there is a rocky patch, with a depth of one fathom (1m8) over it; Passe du Bengali is entered from south-westward between this rocky patch and the westernmost sandbank of the foul area previously mentioned, about half a mile southward.

Banc du Sud-Ouest (South-west bank), a sandy spit, with a depth of less than 6 feet (1m8) over it, and a drying patch on its southern side, extends about 1¼ miles westward from Pointe Sud-Ouest (South-west point), the south-western extremity of Nau chow, with depths of less than 6 feet (1m8) over it, and depths of 3 fathoms (5m5) and less extend half a mile farther westward.

Chenal Nord-Ouest is entered from southward between Banc du Sud-Ouest and Banc du Fer à Cheval, which extends about 2 miles southward from Pointe du Bouquet, the south-eastern extremity of Tung-hai tao. At the southern extremity of Banc du Fer à Cheval there is

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Chart 3349.

a depth of 3 fathoms (5m5), and parts of the bank dry as much as 8 feet (2m4), and at low water springs it is nearly connected to Pointe du Bouquet; within the latter there is a clump of trees.

Vessels entering Passe de la Surprise should shape course to pass about 2 miles south-westward of Grand Plateau, which is nearly always visible, and 1½ miles from Pointe Sud-Ouest.

Passe du Bengali.—Passe du Bengali is narrow and lies between the foul ground lying south-eastward of Nau chow and that island. The shoals on either side are steep-to, and the passage should only be navigated at low water when Ecueil Frochen is visible. On the north-western side of the passage a reef extends about 4 cables from Pointe Sud-Est. Ecueil Frochen, which dries 5 feet (1m5), lies about one mile southward of Pointe Sud-Est.

Passe du Bengali is entered from northward between Ecueil (Rock) A, which dries 4 feet (1m2), situated about 2½ miles north-eastward of Ecueil Frochen and Pointe Falaise, on the eastern side of Nau chow, about 1¼ miles westward.

Vessels proceeding through Passe du Bengali should pass close north-westward of Ecueil Frochen and about half a mile off Pointe Falaise.

Nau chow.—Lights.—Nau chow lies about 24 miles northward of Gopai point (page 411). From the offing the island appears as a flattened cone, the summit of which, 271 feet (82m6) high, is bare. The lighthouse on the summit is very prominent; but, approaching from northward, the summit of the island is difficult to distinguish. The northern side of the island is composed of sandhills, from 40 to 50 feet (12m2 to 15m2) high, from which reefs extend half a mile.

A light is exhibited, at an elevation of 337 feet (102m7), from a grey tower, about 62 feet (18m9) in height, on the summit of Nau chow; it is sometimes obscured by clouds.

A light is exhibited, at an elevation of 51 feet (15m5), from a black and white tower, about 26 feet (7m9) in height, on the northern coast of Nau chow, about 2½ miles northward of the light-tower on the summit.

These lights in line bear 181°.

On Pointe Sud-Ouest (*Lat. 20° 52′ N., Long. 110° 34′ E.*) there is a conical tower, the upper part of which is black and the lower white. Fort Boutet, in ruins, stands on Pointe Ouest (West point), the western extremity of the island, near several large trees.

A conical tower, reported, in 1946, to be painted in white and black bands, stands on the coast about 4 cables eastward of Pointe Nord (North point), the northern extremity of the island. The village of Yen lao is situated about one mile farther east-south-eastward.

Tam Sui, the principal town, is situated close south-eastward of Pointe Ouest. The deputy of the Governor of the territory resides here. Junk harbour, a small shallow bay with a narrow entrance, is situated nearly midway between the western and south-western extremities of the island.

Chenal Nord-Ouest.—Buoys.—Chenal Nord-Ouest is about 4 cables wide between the western extremity of Nau chow and Banc du Fer à Cheval. Farther northward the channel passes between Banc du Nord-Ouest (North-west bank), which dries 2 feet (0m6), lying close off the north-western side of Nau chow, and Banc du Milieu (Middle bank), about 4 cables north-westward. A portion of Banc du Milieu,

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Chart 3349.

near the middle on its eastern side, dries 2 feet (0m6), and a patch, about 4 cables southward of this portion, is awash at low water.

A red conical buoy, moored on the eastern side of the channel about 1¾ miles north-north-eastward of Pointe Ouest, marks the south-western end of Banc du Nord-Ouest. A red conical buoy, moored 9 cables north-north-westward of Pointe Nord, marks the eastern side of the northern entrance to Chenal Nord-Ouest.

Swatchway, with a least depth of 14 feet (4m3) in the fairway, lies between Banc du Milieu and the eastern side of Tung-hai tao.

Tidal streams.—Nau chow divides the tidal streams into two portions, one portion passing northward of the island, and the other, southward. The west-going tidal streams meet at Banc du Fer à Cheval and the east-going stream separates there.

Anchorages.—Vessels can anchor southward of Banc du Fer à Cheval, with Nau chow lighthouse bearing 080°, in depths of from 5 to 9 fathoms (9m1 to 16m5), sand.

Vessels can anchor in Chenal Nord-Ouest, about three-quarters of a mile northward of Fort Boutet, in depths of from 5 to 10 fathoms (9m1 to 18m3), sand and mud.

During the South-west monsoon vessels can anchor off the northern end of Nau chow, about 1½ miles northward of the northern lighthouse, in a depth of about 7 fathoms (12m8).

Small vessels can find temporary shelter off the southern side of Nau chow.

Anchorage is indicated on the chart in the north-eastern entrance of Passe du Bengali, about one mile north-eastward of Pointe Falaise, in a depth of about 6 fathoms (11m0).

Rade de Nau chow.—Aspect.—Rade de Nau chow lies northward of Nau chow; on its western side is Tung-hai tao and on its north-western side, Ile des Aigrettes.

Mont Jacquelin (*Lat. 21° 02′ N., Long. 110° 31′ E.*) (page 429) is situated about 9 miles north-westward of the summit of Nau chow, and about one mile inland from the eastern coast of Tung-hai tao. Sand-hills stretch from the coast to the foot of the hill; the summit of the hill is generally covered, and sometimes appears to rise from the clouds.

Mont Jacquelin, bearing 274°, distant 15 miles.
(*Original dated* 1933.)

Colline Rouge, 97 feet (29m6) high, lies about 2½ miles northward of Mont Jacquelin. A tower in ruins is situated about 1½ miles north-westward of Colline Rouge.

On the southern end of Ile des Aigrettes there are some wooded hills, prolonged northward by high sand dunes. Colline Verte, which is only wooded on its southern and western sides, is the most conspicuous of these hills, and lies about 3 miles north-north-eastward of Colline Rouge and three-quarters of a mile inland.

Morne du Bouquet, which is saddle-shaped and covered with trees,

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is situated near the south-western extremity of Ile des Aigrettes, about 1½ miles westward of Colline Verte.

Dangers. — Buoy. — Lights. — Beacons.— The coastal bank, with depths of less than 3 fathoms (5m5) over it, extends about 3½ miles eastward from Tung-hai abreast Mont Jacquelin. The northern part of this bank, which dries 6 feet (1m8), extends about one mile east-south-eastward from the north-eastern extremity of Tung-hai tao, and two patches, one of which is awash at low water and the other of which dries 2 feet (0m6), lie about half a mile farther south-eastward.

A detached shoal, with a least depth of 17 feet (5m2) over it, lies with its western end about 5½ miles east-south-eastward of Mont Jacquelin and extends about 2 miles eastward; a 3-fathom (5m5) patch lies between the western end of this shoal and the outer edge of the coastal bank.

A bank, with depths of less than 3 fathoms (5m5) over it, extends about 6½ miles south-eastward from the south-eastern extremity of Ile des Aigrettes. On this bank there are several patches which dry, or have depths of less than 6 feet (1m8) over them, the positions of which can best be seen on the chart. During the North-east monsoon this bank is marked by breakers.

South-westward of the above bank and on the north-eastern side of the fairway leading to the entrance of Kuang-chou wan, a detached shoal, with a least depth of 15 feet (4m6) over it, lies about 5 miles eastward of Mont Jacquelin; this latter shoal is marked on its south-western side by a pillar buoy, surmounted by a triangle.

Leading lights are situated on the eastern side of Tung-hai tao, eastward of Mont Jacquelin. The front light is exhibited, at an elevation of 49 feet (14m9), from a white tower with black bands, about 28 feet (8m5) in height, situated near the coast. The rear light is exhibited, at an elevation of 168 feet (51m2), from a white wall painted with black bands, about 18 feet (5m5) in height, about 6 cables westward of the front light. These lights in line bear 275°.

It was reported, in 1935, that the structures from which these lights are exhibited are not visible at a greater distance than about 4 miles.

Leading beacons are situated on the north-eastern end of Tung-hai tao. The front beacon, consisting of a concrete tripod having a white topmark, with black horizontal bands, stands about 8 cables eastward of Colline Rouge. The rear beacon, a similar structure, stands on the summit of Colline Rouge (*Lat. 21° 04′ N., Long. 110° 32′ E.*). These beacons in line bear 275°.

Leading lights are situated on the south-eastern end of Ile des Aigrettes. The front light is exhibited, at an elevation of 30 feet (9m1), from a white pylon with black bands, about 25 feet (7m6) in height, and surmounted by a triangle, situated about 4 cables south-eastward of Colline Verte. The rear light is exhibited, at an elevation of 89 feet (27m1), from a white tower with black bands, about 26 feet (7m9) in height, situated on Colline Verte. These lights in line bear 329°. A prominent house stands close westward of the rear leading light-structure.

Channels leading to the entrance.—Passe du Mont Jacquelin leads into Rade de Nau chow over a bar with a least depth, in 1949, of 20 feet (6m1) and with the leading lights eastward of Mont Jacquelin bearing 275°. On the northern side of the pass is the bank extending

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Chart 3349.

south-eastward from Ile des Aigrettes and the 15-foot (4m6) shoal which is marked by a pillar buoy. On the southern side of the passage is the detached shoal lying 5¼ miles east-south-eastward of Mont Jacquelin. At the western end of the pass, the leading lights on the south-eastern end of Ile des Aigrettes are in line, bearing 329°, and about 2 cables farther westward, Nau chow light is in line with the light on the northern side of that island, bearing 181°.

In 1947, vessels with a draught of 27 feet (8m2) could reach the anchorage off Hsi ying at high water.

Passe du Lapérouse leads over the bank extending south-eastward from Ile des Aigrettes, in a depth of 13 feet (4m0), with the leading beacons, situated on the north-eastern side of Tung-hai tao, bearing 275°. At the western end of this pass, the leading lights on the south-eastern end of Ile des Aigrettes are in line, bearing 329°.

A channel, which passes close south-westward of the 15-foot (4m6) shoal, mentioned above, connects the western ends of Passe du Mont Jacquelin and Passe du Lapérouse, and leads towards the entrance of Kuang-chou wan, with the leading lights at the south-eastern end of Ile des Aigrettes in line.

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Kuang-chou wan.—Goulet de Kuang-chou (Kwangchow) wan is about one mile wide between the narrow drying banks which fringe the coast on either side. The navigable channel, within the bay, has a least width of only about 1½ cables between the shoals with which it is encumbered; there is, however, a depth of not less than 4 fathoms (7m3) on the various leading lines through the fairway.

The coasts are low and sandy, fringed nearly everywhere by banks of soft mud which dry. There are, however, some red cliffs, and some clumps of trees sheltering villages.

O Tung-t'ou-shan (Tong téu san) lies in the western part of the bay, about 6 miles westward of Morne du Bouquet (*Lat. 21° 06′ N., Long. 110° 32′ E.*). There is a prominent white cone-shaped mark on the south-eastern end of the island. Chenal de l'Estoc is entered from north-eastward between O Tung-t'ou-shan and Pointe Portalis, about 3 miles north-north-westward.

Chenal de l'Estoc runs between Lui-chow peninsula and Tung-hai tao, and connects Kuang-chou wan with the channel leading through the shoals southward of that island (*see* page 429). Chenal de l'Estoc is only available for small vessels with local knowledge; it is sheltered throughout its length and enables vessels to avoid passing over the bar, on which the sea is sometimes dangerous for small vessels during the North-east monsoon.

Ile Tak-Tchin (Tak chin), which is cultivated and containing several villages, lies on the eastern side of the main channel about one mile eastward of Pointe Portalis.

Kuang-chou wan extends northward of the line joining Pointe Marqués, the western extremity of Ile Tak-Tchin, and Pointe Portalis as far as the mouth of Wu-li-shan chiang (Matshé river), which is entered between Pointe Nivet, on the eastern shore, about 2½ miles north-north-eastward of Pointe Marqués, and Hsi-ying (Fort Bayard), a town on the Lui-chow peninsula, about three-quarters of a mile westward.

On the eastern side of this part of the bay, Port Beaumont is situated

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Chart 3486.

between Ile Tak-Tchin and Ile Pak-hai Sud (South Pak-hai island), about 3 cables northward. Ile Pak-hai Nord (North Pak-hai island) lies a short distance northward of Ile Pak-hai Sud.

Chenal des Aigrettes, entered from westward between the western end of Ile Pak-hai Nord and a point 6½ cables south-eastward of Pointe Nivet, is only available for native boats, and connects the northern end of Kuang-chou wan with the sea, which it enters northward of Ile des Aigrettes.

Coast.—Dangers.—The northern side of Kuang-chou wan is low and swampy, and intersected by several waterways, navigable by junks and which are connected with Chenal des Aigrettes. At Pointe Pyramide, situated on the southern side of Ile Roa Da, 4 miles north-westward of Morne du Bouquet, the coast consists of red cliffs.

The north-western end of Banc du Nord (North bank), an extensive bank, which dries 5 feet (1^{m}5), lies on the northern side of Chenal du Youyou (Yuyu channel), about half a mile south-south-westward of Pointe Pyramide.

Pointe de la Jonque, the western extremity of Ile Roa Da, lies about 2 miles north-westward of Pointe Pyramide. Port Beaumont is entered from south-eastward between Pointe de la Jonque and Pointe des Eponges, the north-eastern extremity of Ile Tak-Tchin, about half a mile west-south-westward.

Banc de Tak-Tchin (Tak chin bank), consisting of sand and rocks, extends about 2¼ miles south-eastward from Ile Tak-Tchin ; the whole of this bank dries and the rocks on it dry from 4 to 12 feet (1^{m}2 to 3^{m}7).

Banc du Milieu (Middle bank), which lies about half a mile southward of Banc de Tak-Tchin, and Bancs de l'Est (East banks), about half a mile eastward of the former, form the northern side of the fairway through Kuang-chou wan. These banks dry over large areas and on them are many rocks, which dry from 3 to 7 feet (0^{m}9 to 2^{m}1), the positions of which can best be seen on the chart.

Chenal du Youyou, in the fairway of which there is a depth of 14 feet (4^{m}3), is entered from southward between the eastern end of Bancs de l'Est and the south-western extremity of Ile des Aigrettes, about 4 cables eastward. This channel leads to Port Beaumont between the banks on the northern side of Kuang-chou wan, and should not be used without local knowledge.

The southern side of Kuang-chou wan is formed by the northern coast of Tung-hai tao. A low sandy spit, which dries, extends westward for about 3 cables from a point on the coast situated about 2¼ miles west-north-westward of Colline Rouge (*Lat. 21° 04′ N., Long. 110° 32′ E.*). This spit forms the northern side of the mouth of a creek.

Tour de l'Observatoire (Observation tower), a red conical tower, 79 feet (24^{m}1) high, stands on a cliff about three-quarters of a mile west-south-westward of the mouth of the creek. Mur de la Dépression, a similar tower with walls extending from its base, stands on the eastern slope of a depression about 1¾ cables south-westward of Tour de l'Observatoire ; hills extend along the coast for about 2½ miles westward of these towers.

Between Mur de la Dépression and Pointe du Cylindre, 5¼ miles west-north-westward, the coastal bank, which dries from one to 10 cables offshore, extends nearly 2 miles offshore in places, with

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depths of less than 3 fathoms (5m5) over it. Bancs de l'Ouest (West banks), which dry, lie on this bank; the coastal bank is connected to that extending south-eastward from O Tung-t'ou-shan.

O Tung-t'ou-shan (page 433) is separated from Pointe du Cylindre by a channel about 1¾ cables wide between the drying shore banks on either side; the fairway of this channel is encumbered with drying rocks and mudbanks. A bank, which dries from one to 5 feet (0m3 to 1m5), extends about one mile from the south-eastern end of O Tung-t'ou-shan. The north-eastern side of the island is fringed by a drying bank which extends about a quarter of a mile offshore; on this bank there are a number of fishing stakes with stone walls.

The coastal bank, with depths of less than 3 fathoms (5m5) over it, extends off this side of Tung-t'ou-shan for as much as 6½ cables offshore in places; near the outer edge of the coastal bank there are several patches, some of which are rocky, with depths of from 7 to 11 feet (2m1 to 3m4) over them. Of these, the one that lies nearest the fairway is a rocky patch, with a depth of 11 feet (3m4) over it, situated about 6 cables east-north-eastward of the south-eastern extremity of the island.

A mudbank, which dries and on which there are fishing stakes, extends about 2 cables from the northern side of O Tung-t'ou-shan. The coastal bank, with depths of less than 3 fathoms (5m5) over it, extends about one mile northward from the island; near the extremity of this bank is a portion, almost detached, on the western side of which there is a rock, with a depth of 5 feet (1m5) over it, and on its eastern side there are two rocks, one with a depth of 7 feet (2m1) over it, and the other, close north-westward, with a depth of 9 feet (2m7) over it. The fairway of the channel north-eastward of these rocks is only a little over 2 cables wide.

The north-western shore of Kuang-chou wan, for about 3½ miles south-westward of Pointe Portalis (*Lat. 21° 10′ N., Long. 110° 24′ E.*), is fringed by a sandbank which dries extending nearly 1½ miles offshore at the south-western end, and near the outer edge of which are several rocky patches which dry from 4 to 7 feet (1m2 to 2m1); Roches des Pêcheurs, which dry 13 feet (4m0), lie on this bank 2 miles south-south-westward of Pointe Portalis and about 6 cables offshore.

Between Pointe Portalis and Hsi-ying, the coast on the western side of Kuang-chou wan is cultivated; a bank, which dries, extends about 2 cables offshore, and a bank, with depths of less than 3 fathoms (5m5) over it, extends about 2 cables farther offshore. Near the outer edge of this bank are several detached patches, with depths of from 2 to 8 feet (0m6 to 2m4) over them. Two rocks, which dry 4 feet (1m2), lie on this bank about 6 cables east-south-eastward of Pointe Portalis, and a rock, which dries 9 feet (2m7), lies on the outer edge of the drying bank, about half a mile north-eastward of the same point.

On the eastern side of the northern part of Kuang-chou wan, the coastal bank extends about 3 cables from the north-western side of Ile Tak-Tchin, between Pointe Marqués and Pointe Fillette, the north-western extremity of the island, and a bank, with depths of less than 3 fathoms (5m5) over it, extends 4 cables northward from Pointe Fillette; some isolated dangers, the positions of which can best be seen on the chart, lie on this coastal bank.

Port Beaumont is entered from north-westward between Pointe

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Chart 3486.

Fillette and Pointe aux Bambous, the south-western extremity of Ile Pak-hai Sud, about half a mile north-eastward.

A bank, with depths of less than 3 fathoms (5m5) over it, extends about 4 cables westward from Ile Pak-hai Sud, leaving a narrow channel between it and the bank extending northward from Pointe Fillette.

Ile Pak-hai Sud and Ile Pak-hai Nord are connected by a drying bank which extends about 1½ cables westward from the latter.

A rock, which dries one foot (0m3), lies about 3 cables southward of Pointe Nivet on the outer edge of the mudbank which extends offshore southward of that point. A detached shoal, with a depth of 15 feet (4m6) over it, lies about 1¼ cables north-westward of the drying rock.

Dangers near the fairway.—Buoys.—A rock, with a depth of 20 feet (6m1) over it, lies close to the northern side of the fairway, south-eastward of the southern end of Bancs de l'Est, about 2¼ miles west-south-westward of Morne du Bouquet. There are fishing stakes, indicated on the chart, on the northern side of the fairway a short distance southward of Bancs de l'Est.

A rock, with a depth of 9 feet (2m7) over it, marked on its western side by a red conical buoy, lies on the north-eastern side of the fairway near the south-western edge of Bancs de l'Est, about 3¼ miles west-south-westward of Morne du Bouquet.

A rock, with a depth of 4 feet (1m2) over it, marked on its south-western side by a red conical buoy, lies on the north-eastern side of the fairway, about 8½ cables west-north-westward of the last-mentioned rock. A detached rocky shoal, with a depth of 10 feet (3m0) over it, lies on the same side of the fairway, about 2 cables west-north-westward of the rock with a depth of 4 feet (1m2) over it.

A conical buoy is moored on the south-western side of the fairway about 1¼ miles eastward of the south-eastern extremity of O Tung-t'ou-shan.

On the south-western side of the fairway, a rock, with a depth of 3 feet (0m9) over it, lies about 7 cables northward of Tour de l'Observatoire (*Lat. 21° 04′ N., Long. 110° 29′ E.*). There are some fishing stakes about 3 cables westward of this rock, and detached, rocky shoals, with depths of from 10 to 20 feet (3m0 to 6m1) over them, extend over 2 miles north-westward from the same rock, on the south-western side of the fairway.

A rock, which dries 2 feet (0m6), lies south-westward of the above-mentioned rocky shoals, about 2 miles south-eastward of the south-eastern extremity of O Tung-t'ou-shan.

The shoals which lie on the south-western side of the fairway, eastward and northward of O Tung-t'ou-shan, are described on page 434.

On the north-eastern side of the fairway, a rock, with a depth of 9 feet (2m7) over it, lies south-westward of Banc du Milieu, about 1¼ miles north-eastward of the south-eastern extremity of O Tung-t'ou-shan.

Two rocks, with depths of 8 feet (2m4) over them, and 1½ cables apart, lie about 1½ miles south-south-eastward of Pointe Marqués.

A rocky shoal, with a depth of 10 feet (3m0) over it, marked on its western side by a red conical buoy, lies close north-eastward of the fairway, about 1½ miles southward of Pointe Marqués.

Charts 2062, 2661a, 1263.

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A rock, with a depth of 14 feet (4m3) over it, lies close eastward of the fairway, about 4 cables southward of Pointe Marqués.

A rock, with a depth of 19 feet (5m8) over it, lies westward of the fairway, about 1½ miles south-eastward of Pointe Portalis.

Two rocks, which dry 4 feet (1m2), situated on the western side of the fairway about 6 cables east-south-eastward of Pointe Portalis, are mentioned on page 435.

Banc de l'Alouette, which dries less than one foot (0m3) at its southern end, and is marked on its south-eastern side by a black conical buoy, lies on the north-western side of the fairway, about one mile south-south-westward of Pointe Nivet.

Lights.—Leading lights are situated on the south-western end of Ile des Aigrettes. The front light is exhibited, at an elevation of 26 feet (7m9), from a white tower with black bands, about 26 feet (7m9) in height, situated 3¾ cables south-south-eastward of Morne du Bouquet. The light on Colline Verte (page 431) is the rear light. These lights in line bear 069°.

Leading lights are situated on the northern end of Tung-hai tao. The front light is exhibited, at an elevation of 28 feet (8m5), from a white pylon with black bands, about 25 feet (7m6) in height, situated on the coast about 2 miles west-north-westward of Colline Rouge. The rear light is exhibited, at an elevation of 51 feet (15m5), from a similar structure, about 37 feet (11m3) in height, situated about 3½ cables east-south-eastward of the front light. These lights in line bear 119°.

Leading lights are situated on the northern side of O Tung-t'ou-shan. The front light is exhibited, at an elevation of 26 feet (7m9) from a white square tower, about 20 feet (6m1) in height, situated on the northern extremity of the island. The rear light is exhibited, at an elevation of 36 feet (11m0), from a similar structure, about 26 feet (7m9) in height, about 1¼ cables southward of the front light. These lights in line bear 178°.

Leading lights are situated near Pointe Portalis (*Lat. 21° 10′ N., Long. 110° 24′ E.*). The front light is exhibited, at an elevation of 30 feet (9m1), from a white pyramidal structure, with black bands, on a platform about 36 feet (11m0) in height, situated about a quarter of a mile south-westward of the point. The rear light is exhibited, at an elevation of 54 feet (16m2), from a white tower with black bands about 34 feet (10m4) in height, situated about 2¾ cables north-westward of the front light. These lights in line bear 320°.

Two pairs of leading lights are situated on Pointe Nivet. The front light of the southern pair is exhibited, at an elevation of 36 feet(11m0), from a white pylon with black bands and surmounted by a rectangle, about 36 feet (11m0) in height, situated close southward of the point. The rear light is exhibited, at an elevation of 46 feet (14m0), from a similar structure, about 36 feet (11m0) in height, situated about 2 cables north-north-eastward of the front light. These lights in line bear 026°.

The front light of the northern pair is exhibited, at an elevation of 28 feet (8m5), from a white tripod with black bands and surmounted by a triangle, situated about three-quarters of a cable northward of the above-mentioned rear light, which also serves as the rear light of the northern pair. These lights, in line, bear 183°, and mark the channel northward of Pointe Nivet.

Tidal streams.—In the entrance to Kuang-chou wan the tidal

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Chart 3486.

streams are strong, sometimes attaining a rate of over 4 knots; their direction follows that of the channel.

In Kuang-chou wan the tidal streams follow the direction of the channel, except in the vicinity of the northern end of O Tung-t'ou shan, where the in-going stream sets towards Chenal de l'Estoc and the out-going stream in the opposite direction.

Anchorage.—There is anchorage, protected from northerly and north-easterly winds, about one cable offshore south-westward of Morne du Bouquet, in a depth of about 7 fathoms (12m8), with good holding ground.

Hsi-ying.—Danger.—The town of Hsi-ying (Fort Bayard), known also to the Chinese as Tsamkong, with a population, in 1946, of 10,000, is situated on the western side of the mouth of Wu-li-shan chiang. The spire of the church near the middle of the town and the radio masts of the disused radio station, about half a mile northward, are prominent, and at night the illuminated dial of the clock tower on the Government buildings.

A pier, about 220 yards (201m2) long, extends eastward from Hsi-ying to the outer edge of the drying shore bank; the foundations for an extension of the pier extend about half a cable farther eastward. In 1946, the depth at the head of the pier was reported to be 15 feet (4m6). A rock, which dries one foot (0m3), lies on the edge of the shore bank, 2½ cables southward of the head of the pier.

Between the pier and Pointe de la Caravane (*Lat. 21° 14′ N., Long. 110° 25′ E.*), about 2 miles northward, there is a bight, at the head of which there are some mangroves; the whole of the bight dries, and is encumbered with fishing stakes. A bank, with depths of less than 5 fathoms (9m1) over it, extends about 3 cables from Pointe de la Caravane.

Tour du Bonheur, which is prominent, stands near the coast about one mile north-north-westward of the pier-head. Two prominent hills, 40 feet (12m2) high, lie close together on the coast about midway between Tour du Bonheur and Pointe de la Caravane; the latter is the eastern extremity of a range of hills.

Rade d'Hoi teou is situated abreast the stretch of coast described above, about one mile northward of Pointe Nivet. Between Pointe Nivet, which is steep-to, and a point about 2 miles north-north-eastward, the eastern side of Rade d'Hoi teou consists of a low cliff, nearly level, within which the land is cultivated and there are several villages hidden by clumps of trees. This part of the coast is fringed by a drying bank, which extends about 2 cables offshore at its northern end. A bank, with a depth of 7 feet (2m1) at its outer end, extends one cable offshore from a position about 3 cables northward of Pointe Nivet. There are some fishing stakes about 4 cables farther northward. The village of Matshé stands on Pointe Nivet.

Tidal streams.—Off Hsi-ying the in-going stream is weak, and commences about 2½ hours after low water at Nau chow. The out-going stream commences about 1¼ hours after high water at Nau chow, and attains a maximum rate of about 1½ knots.

Anchorages.—Vessels usually anchor in a position about a quarter of a mile north-eastward of the head of the pier at Hsi-ying, in a depth of 6½ fathoms (11m9). If anchoring below the pier, vessels should give a good berth to the drying rock southward of the pier.

Charts 2062, 2661a, 1263.

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Chart 3486.

A recommended anchorage is with the cathedral bearing 245°, distant about three-quarters of a mile, in a depth of about 10 fathoms (18m3).

During typhoons, a better anchorage may be obtained in Rade d'Hoi teou, on the line of the northern leading beacons on Pointe Nivet, in a depth of 49 feet (14m9), mud, and good holding ground.

The quarantine and explosives anchorages, and the anchorage for vessels with mineral oil cargoes, lie southward of Banc de l'Alouette.

Prohibited anchorage.—Anchorage is prohibited in an area, indicated on the chart, about half a mile northward of Pointe Nivet.

Directions.—After crossing the bar as directed on page 432 a vessel should approach the entrance of Kuang-chou wan with the lighthouse on Colline Verte in line with the light-tower below it, bearing 329°. When the beacon on Colline Rouge, at the northern end of Tung-hai tao, bears 259°, or at night, when just within the *red* sector of the light situated about 1¼ miles westward of Colline Rouge, bearing about 270°, she should steer 285° through the entrance until the light-tower on Colline Verte is in line with the light-tower situated on the south-western end of Ile des Aigrettes, when she should keep them in line, astern, bearing 069°. When the light-towers on the northern end of Tung-hai tao are in line, bearing 119°, she should steer with them astern on that bearing until the light-towers near Pointe Portalis are in line, bearing 320°, when she should keep on this alignment, hauling a little south-westward of the leading line when passing the shoal, with a depth of 10 feet (3m0) over it, lying about 1½ miles southward of Pointe Marqués. Then she should alter course and bring the light-towers on the northern side of O Tung-t'ou-shan to bear 178°, astern, and keep them in line, passing about 1½ cables westward of Pointe Marqués. When the light-structures on Pointe Nivet are in line she should steer for them, bearing 026°, until eastward of Banc de l'Alouette (*Lat. 21° 11′ N., Long. 110° 25′ E.*), when she should steer for the anchorage off Hsi-ying.

Port facilities.—The Customs house is at the root of the pier at Hsi-ying; the police carry out the duties of the Harbour and Customs authorities.

Water is available, but there are no facilities for obtaining it.

There is a hospital at Hsi-ying.

Trade.—The chief exports are pigs, poultry, cattle, and mats. The imports are manufactured articles.

Communication.—There is frequent steamer communication with Hong Kong, also regular steamer communication with Haïphong and other ports in Tongking gulf.

Hsi-ying is connected to the general telephone and telegraph systems.

Wu-li-shan chiang.—Northward of Rade de Hoi teou, Wu-li-shan chiang (Matshé river) leads to Ch'ih-k'an (Che-kam), a town situated at the mouth of a creek of the same name, about 4½ miles north-westward of Pointe de la Caravane.

T'iao-shun-ts'un (Tao-cien) island lies near the eastern edge of the extensive drying mudflat which extends from the western shore northward of Ch'ih-k'an; its southern end is situated about 2 miles eastward of that town.

The town of Matshé or Mapum is situated on the eastern side of the river about 3 miles north-north-eastward of T'iao-shun-ts'un. A river discharges into Wu-li-shan chiang a short distance northward of

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Chart 3486.

Matshé. The town of T'uan-liu (Montao) stands on the eastern bank of Wu-li-shan chiang about 4 miles north-westward of Matshé.

Depths of 5 fathoms (9m1) can be carried as far as the northern end of Tiao-shun-ts'un on its eastern side; northward of Tiao-shun-ts'un the depths decrease. Small vessels with local knowledge can ascend the river as far as the entrance to Passe de Shekmun, situated about 1½ miles south-south-eastward of T'uan-liu.

Approach to Ch'ih-k'an. — Dangers. — Lights. — On the eastern side of Wu-li-shan chiang, between a point 2 miles north-north-eastward of Pointe Nivet and Pointe Tumulus, on which is an isolated hill, 30 feet (9m1) high, about 1½ miles north-north-westward, there is a bight, the whole of which dries, the inner part being occupied by islets and mangroves. A bank, which dries, and is steep-to, extends about 3½ cables westward from Pointe Tumulus. Between this point and the entrance to Chenal de Potao, about 2¼ miles northward, the shore consists chiefly of mangroves, and from which a bank, which dries, extends from about one to 3 cables, and with depths of less than 3 fathoms (5m5) over it, extends about 6½ cables offshore.

A detached mudbank which dries 2 feet (0m6), lies about 1¼ miles north-north-westward of Pointe Tumulus and about 3 cables offshore. A rock, which dries less than one foot (0m3), lies about 2¼ cables south-westward of the southern end of this bank.

On the south-western side of the river, between Pointe de la Caravane (*Lat. 21° 14′ N., Long. 110° 25′ E.*) and the southern end of Pe-se cliffs, about 2¼ miles north-westward, the coast is fringed by a mudbank, which extends from 1½ to 2½ cables offshore, and dries from 3 to 8 feet (0m9 to 2m4). The shoal bank, on the outer edge of which are some rocky patches, with depths of less than 6 feet (1m8) over them, extends about 4 cables off this part of the coast. A detached rocky patch, with a depth of 15 feet (4m6) over it, lies about 6 cables northward of Pointe de la Caravane and 3½ cables offshore.

A light is exhibited, at an elevation of 36 feet (11m0), from a white tower with black bands, about 16 feet (4m9) in height, on Pointe de la Caravane.

Leading lights, in line bearing 164°, are exhibited near the south-eastern end of Pe-se cliffs. The front light is exhibited, at an elevation of 19 feet (5m8), from a white tower, with black bands, about 10 feet (3m0) in height. The rear light is exhibited, at an elevation of 39 feet (11m9), from a similar structure, about 13 feet (4m0) in height, situated about half a cable south-south-eastward of the front light.

Leading lights, in line bearing 297°, are exhibited at Ch'ih-k'an. The front light is exhibited, at an elevation of 16 feet (4m9), from Sha-wan tower. The rear light is exhibited, at an elevation of 49 feet (14m9), from a white tripod with black bands, and with a platform and a daymark, about 46 feet (14m0) in height, situated about half a mile west-north-westward of the front light.

A bank, which dries from one to 7 feet (0m3 to 2m1), extends from 1½ to 3 cables from the south-eastern side of Tiao-shun-ts'un, and 5½ cables from the southern extremity. A rocky bank, with depths of from 4 to 6 feet (1m2 to 1m8) at its outer end, extends about one mile south-south-eastward from the southern end of the island. A narrow channel leading to the anchorage off Ch'ih-k'an, situated about 4 cables south-westward of the south-western extremity of Tiao-shun-ts'un, is

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Chart 3486.

entered between the southern end of the above-mentioned bank and a rocky bank, with a depth of 8 feet (2m4) over it, at its outer end, lying about 2 cables south-eastward; this latter bank extends about half a mile from the south-western side of the river. There is a depth of 10 feet (3m0) over the bar at the entrance to the channel.

A chimney stands on the coast near the north-western end of Pe-se cliffs about one mile north-westward of the south-eastern end of them. Sha-wan tower, a white square building with black bands, about 23 feet (7m0) in height, is situated on the coast about half a mile farther north-westward. There is a chimney close south-eastward of Sha-wan tower.

The town of Ch'ih-k'an (Che-kam) stands about one mile westward of Sha-wan tower, at the head of a bight, which dries. A causeway, about 1¼ miles long, is situated on the southern shore of the bight eastward of Ch'ih-k'an. This causeway passes over the land close southward of Sha-wan tower and its extremity lies near the edge of the drying shore bank.

Ch'ih-k'an is the commercial centre of the territory of Kuang-chou wan and had, in 1946, a population of 30,000. The town is connected to the general telephone and telegraph systems.

Anchorage.—Directions.—Vessels can anchor about 2 miles northward of Pointe de la Caravane, in depths of not less than 5 fathoms (9m1). Ch'ih-k'an should not be approached without local knowledge.

Chart 2062.

COAST.—Dangers.—Between the entrance of Kuang-chou wan and the white fort (*Lat. 21° 14′ N., Long. 110° 38′ E.*), about 10 miles north-north-eastward, the coast is low and sandy. Northward of the fort is the estuary of Huang-p'o (Muiluk river), which has not been surveyed. Breakers extend about 3 miles off this estuary. Ngchün-yün harbour, reported to be available for small shallow-draught vessels, is situated about 5 miles up Huang-p'o. A peak, 460 feet (140m2) high, lies about 10 miles north-north-westward of the fort.

From the estuary of Huang-p'o, the coast continues low, and trends 24 miles north-eastward to An kang shan, a bold cliff, 515 feet (157m0) high. This portion of the coast has not been surveyed, and should be given a wide berth. A one-fathom (1m8) rocky patch lies about 13 miles east-north-eastward of the white fort, and 2½ miles offshore. A sunken rock lies about half a mile southward of An kang shan and similar rocks fringe the coast for a distance of 4 miles westward.

The entrance to Shui-tang (Sui-tung) harbour, which is narrow and dangerous, lies close north-eastward of the extremity of a peninsula which extends about 5 miles east-north-eastward from An kang shan and on which are two remarkable conical hills, from 30 to 60 feet (9m1 to 18m3) high. A bar, with a depth of 6 feet (1m8) over it, lies from 2 to 3 miles south-eastward of the south-western entrance point of the harbour. The banks in the vicinity of the bar are subject to change during strong winds and the sea breaks heavily upon them. Within the entrance, a narrow channel, between mudbanks, leads to the village of Shui-tang (Sui-tung), about 5 miles north-westward of the entrance, where there is a post and telegraph office.

Shui-tang is the port of Kochow, 35 miles distant, and has a large export trade in cattle, pigs, poultry, salt, sugar, and hemp.

Charts 2661a, 1263.

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Chart 2212.

Chim shan, a white hummock, about 70 feet (21m3) high, is situated on the coast midway between the entrance to Shui-tang harbour and a point, on which there is a fort, about 9 miles eastward. A shallow bank, which dries at its eastern end, extends from 2 to 3 miles from this part of the coast. Black rocks and Marble rock, both above water, lie near the edge of this bank. Marble rock is prominent when entering Tien-pai harbour.

Current.—During the North-east monsoon there is stated to be an almost constant westerly current along this coast, which attains a rate of from half a knot to 1½ knots.

Tidal streams.—Between Lui-chow peninsula and Hai-ling-chiang (page 443) the tidal stream appears to attain a rate of about three-quarters of a knot setting westerly on the rising tide and easterly on the falling tide. The monsoon current, which must be added to the above to give the total flow, averages about one knot eastward from June to August, and from three-quarters of a knot to one knot westward from November to March.

Tien-pai harbour.—Dangers.—Tien-pai (Tien pak) harbour is entered between Black rocks and Ta-fang-chi (Tai fung kioh), an islet 400 feet (121m9) high, about 4 miles south-south-eastward. A bank, with a depth of 2½ fathoms (4m6) over it, extends about 1½ miles northward from Ta-fang-chi. Fung kai chau, with a sunken rock nearly half a mile off its north-western extremity, lies on the south-eastern side of the harbour, 1½ miles north-eastward of Ta-fang-chi.

Sieho point, the southern extremity of Lam tau, a peninsula, lies about 2 miles east-north-eastward of Fung kai chau, with Pauk piah, a large white rock, between. A rock, awash at times, lies close westward of Pauk piah and there is a sunken reef between this rock and Fung kai chau.

Sieho reef, with an above-water rock near its centre, lies from one to 2 miles east-south-eastward of Sieho point and about half a mile offshore. A sunken rock lies about one mile north-westward of Sieho point and half a mile off the western side of Lam tau.

Lam tau is connected with the mainland by an isthmus of sand. The southern side of the peninsula is hilly and has a rounded appearance from eastward.

A narrow channel, passing close westward of the north-western extremity of Lam tau, leads in a northerly direction between banks, which dry, to the mouth of a river situated between the point with a fort on it, previously mentioned, and a point with two forts on it close north-eastward. The entrance to the river is obstructed by a sunken rock which lies about half a mile south-eastward of its western entrance point.

A village is situated on the northern bank of the river, a short distance within the entrance. Junks enter the river to load salt.

Tien-pai (*Lat. 21° 30′ N., Long. 111° 15′ E.*) is a walled town, situated at the head of the shallow bight which lies between the eastern entrance point of the river and the north-western extremity of Lam tau. Tien-pai can only be approached in boats at high water through the creeks which intersect the banks in the bight. It is the principal salt port on the southern coast of China.

There is a post office at Tien-pai.

Anchorage.—Directions.—A small vessel with local knowledge

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Chart 2212.

can find shelter, during the North-east monsoon, westward of Sieho point, between Pauk piah and the sunken rock northward of it, in a depth of 4 fathoms (7m3), sand and mud. Larger vessels with local knowledge may anchor, sheltered from south-westerly winds, just north-westward of the line joining Ta-fang-chi and Fung kai chau, in a depth of 6 fathoms (11m0); in this position Fung kai chau and Sieho point will break the force of all north-easterly winds. A considerable swell is felt in both these anchorages during the North-east monsoon.

Vessels should not enter the channel leading to the river without local knowledge. The best time to enter is near low water, as the banks on either side would then be more easily discerned.

Coast.—Off-lying islets.—From Lam tau, the coast trends north-eastward for about 7 miles; thence to a point about 6 miles eastward there is a shallow bay. The town of Guitong, connected to the telegraph system and near which there is a boat harbour, stands on the eastern side of this bay, on the southern side of the mouth of Wu lan ho. A drying bank, with a rock, 50 feet (15m2) high, near its extremity, extends about 2 miles south-westward from the coast at Guitong.

Ta-chu chou (Tai chuk chau), an islet, 285 feet (86m9) high, lies about 7 miles eastward of Sieho point and 2¾ miles offshore. There is anchorage for vessels with local knowledge, with shelter from easterly winds, half a mile or more, westward of the islet, in depths of from 4 to 6 fathoms (7m3 to 11m0), fine sand. A reef, part of which is above water, lies about one mile northward of Ta-chu chou.

Ch'ing chou (Chin chu), an islet, 415 feet (126m5) high, and covered with grass and bushes, lies about 5 miles east-north-eastward of Ta-chu chou and 1¼ miles offshore. A reef, on which is a rock awash and on which the sea generally breaks, extends about one mile southward from Ch'ing chou; and a rock, with a depth of 4 feet (1m2) over it, lies about 1½ miles south-westward of it. Eastward of Ch'ing chou there are depths of 5 fathoms (9m1) over foul ground, and westward, between it and Ta-chu chou, the bottom consists of gravel. A rock, 20 feet (6m1) high, lies between Ch'ing chou (*Lat. 21° 29′ N., Long. 111° 27′ E.*) and the coast; a rock above water and some sunken rocks lie a short distance north-westward of the 20-foot (6m1) rock and close offshore.

Song yui point, about 10 miles east-north-eastward of Ch'ing chou, is low and sandy. A reef, on which are some islets and which is steep-to, extends 1¼ miles south-south-westward from the point.

Between Song yui point and a low sandy point, about 9 miles north-eastward, there is a bay, backed a short distance inland by the Rugged mountains. Shuang-shan (The Brothers), two islets, lie in the south-western part of the bay, on a rocky spit, which extends about 2 miles east-north-eastward from a point about 1½ miles north-north-eastward of Song yui point. A bank, with depths of less than 3 fathoms (5m5) over it, extends from 1½ to 2 miles from the head of the bay.

Chart 2212, plan of Hui-ling-san harbour.

Hai-ling chiang. — Dangers. — Hai-ling chiang (Hui-ling-san harbour) is entered close westward of the south-western extremity of Hai-ling tao (Hui ling san), situated about 9 miles east-north-eastward

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Chart 2212, plan of Hui-ling-san harbour.

of Song yui point. The harbour is open south-westward, but, during the North-east monsoon, affords good shelter to one or two vessels of moderate draught, in depths of from 4 to 6 fathoms (7m3 to 11m0). Small craft can find shelter at all times.

Between the south-western extremity of Hai-ling-tao and Deepwater point, about 6 cables northward, a drying sandbank extends about 4½ cables south-westward; Mame chau, two islets close together and fringed by sunken rocks, lie on the outer end of this sandbank. Close southward and westward of the rocks fringing these islets there is deep water. A detached 2-fathom (3m7) patch lies about one mile west-south-westward of the western islet, and the eastern end of a bank, which dries, lies about half a mile northward of the patch. A shoal, with a least depth of 2¼ fathoms (4m1) over it and with a 3-fathom (5m5) patch close southward, lies on the western side of the fairway about 3½ cables westward of Deepwater point.

Between Deepwater point and a point about one mile north-north-eastward, there are two shallow bays separated about midway by a projection from the coast. Tip chau, fringed by sunken rocks on its southern, western, and northern sides, lies close off the projection. Hui-ling Potoi fort stands on the northern entrance point of the northern bay and makes a good mark for entering the harbour; there is a prominent white tomb below the eastern wall of the fort. The village of Cha-p'o (Chino) is situated in the south-eastern part of this bay.

The northern part of the harbour is mostly shallow. An extensive bank, with depths of less than 3 fathoms (5m5) over it, projects into the middle of the harbour; the south-eastern end of this bank is situated about half a mile south-westward of Hui-ling Potoi fort. A detached shoal, with a depth of 2½ fathoms (4m6) over it, lies close off the southern end of this bank.

Anchorages.—There is anchorage, with the southern extremity of Tip chau bearing 073°, distant 4 cables, in a depth of about 7 fathoms (12m8). There is anchorage abreast Hui-ling Potoi fort, in depths of from 4 to 5 fathoms (7m3 to 9m1).

Shallow draught vessels can anchor in the southern of the two bays northward of Deepwater point, in a depth of about 2½ fathoms (4m6), or in the northern bay within Tip chau, where there are depths of from 8 to 9 feet (2m4 to 2m7). There are some landing steps in this bay, available for boats at any state of the tide.

H.M.S. *Hollyhock*, in 1923, anchored with Hui-ling Potoi fort bearing about 042°, distant 6 cables, in a depth of about 5 fathoms (9m1), soft mud and good holding ground.

Supplies.—Fish and small quantities of vegetables can be obtained.

Chart 2212.

Hai-ling tao.—Dangers.—Sugar loaf, the summit of Hai-ling tao (*Lat. 21° 37′ N., Long. 111° 52′ E.*), 1,350 feet (411m5) high, lies about 6 miles north-eastward of the south-western extremity of the island. The island is separated from the mainland by a narrow passage which has not been surveyed. Bluff point lies on the southern side of the island, about 2½ miles eastward of the south-western extremity; a peak, 1,260 feet (384m0) high, lies about 1½ miles northward of Bluff point. Between the latter and the south-eastern extremity of the island, about 9 miles east-north-eastward, there are two bights. Three

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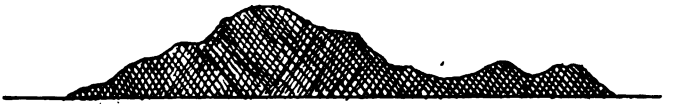
Chart 2212.

rocks, above water, lie on a reef, about one mile wide, which extends offshore about 4 miles east-north-eastward of Bluff point. A reef, nearly covered at high water, lies about three-quarters of a mile southward of the south-eastern extremity of Hai-ling tao, and an islet lies close eastward of the same extremity. On the eastern side of Hai-ling tao there is a patch of red sand, visible from south-eastward.

Off-lying islands.—Tung-ta-fan shih (Mandarin's Cap) or Fans-hiak, a barren white rock, about 200 feet (61m0) high, with a steep summit, lies about 23 miles south-eastward of the south-eastern extremity of Hai-ling tao. Tung-hsiao-fan shih, a high rock, lies half a mile northward of Tung-ta-fan shih, with a rock, awash, between.

Nan-p'eng (Nampang), 798 feet (243m2) high at its western end, and steep-to, lies about 10 miles west-north-westward of Tung-ta-fan shih.



Nan-p'eng, bearing about 045°, distant 7 miles.
(*Original dated* 1923.)

Huang-ch'ing (Round island), 310 feet (94m5) high, so named from its appearance, lies 3¼ miles westward of Nan-p'eng. Two rocks lie about one mile and 1⅝ miles, respectively, south-south-westward of Huang-ch'ing; the southern rock is 30 feet (9m1) high, and the northern, 10 feet (3m0) high. In 1916, the master of the s.s. *Shanghai* reported breakers about a quarter of a mile southward of Huang-ch'ing.

Erh-huo (Ni wok), an island, 390 feet (118m9) high, with a sunken rock close off its western extremity, and another close off its south-eastern side, lies 3½ miles north-westward of Nan-p'eng. Quoin, an islet, 270 feet (82m3) high, so named from its appearance, lies about one mile east-south-eastward of Erh-huo; a rock, 40 feet (12m2) high, lies close south-westward of Quoin.

Ta-huo (Tai wok), an island 419 feet (127m7) high, and having the appearance of a saddle when viewed from south-westward, lies about 1½ miles north-north-westward of Erh-huo, and 6½ miles off the eastern side of Hai-ling tao; a rock, awash, and on which the sea sometimes breaks, lies about one mile south-westward of Ta-huo.

Coast.—Deep bay, the inner part of which is shallow, is entered between the south-eastern extremity of Hai-ling tao and Ta-ao-hsü (Tai oa point) (*Lat. 21° 43′ N., Long. 112° 13′ E.*), 15 miles east-north-eastward.

Deep bay has not been surveyed. Mo-yang chiang discharges between two forts, half a mile apart, about 13 miles west-north-westward of Ta-ao-hsü. Westward of the mouth of Mo-yang chiang the coast is fringed by a shallow bank which extends from 2 to 5 miles offshore, and eastward of the mouth, for a distance of about 10 miles, by a shallow bank extending about 2 miles offshore; some sunken rocks lie on the latter bank.

Yang-chiang (Yeungkong), a town, which can be identified by its seven pagodas, is situated about 3 miles up the Mo-yang chiang. The town is connected to the general telegraph system.

Tai oa bay lies at the eastern end of Deep bay and is entered between

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Chart 2212.

Ta-ao-hsü and a point about 2 miles north-westward. The bay is shallow and has not been surveyed. Chiao chou lies midway between the entrance points; rocks, covered at high water, lie about one mile south-westward of this island and there are some sunken rocks close eastward of the island, and also within the bay.

The village of Tai oa stands at the head of the bay. Small craft with local knowledge can find shelter close off the village, in a depth of 2 fathoms (3m7).

Currents.—During the North-east monsoon, and also in August and September, when easterly winds frequently prevail, the current sometimes sets westward at the rate of 3 knots off Tung-ta-fan shih, abating only to 1½ knots when the tidal stream, under ordinary circumstances, would be setting eastward. Frequently in the South-west monsoon, if the wind shifts to an easterly direction, a westerly set is experienced.

Coast.—Between a point about 7 miles eastward of Ta-ao-hsü and the western entrance point of Yai-men (Ngae mun), about 50 miles north-eastward, the coast has not been thoroughly surveyed. A bank, consisting chiefly of mud, extends off this part of the coast for a considerable distance, the extent of which can best be seen on the chart. There are several islands on the bank and others near its outer edge. The southern extremity of Haiyu, an island lying close offshore, is situated about 18 miles eastward of Ta-ao-hsü. A channel, about half a mile wide, leading to Tai wu san, runs between the western side of Haiyu and the coast. There are depths of from 4 to 7 fathoms (7m3 to 12m8) in this channel, but only from one to 2 fathoms (1m8 to 3m7) in the approach to it. The southern extremity of Tongkwa, a peninsula extending from the mainland (chart 2562), lies about 20 miles east-north-eastward of the southern extremity of Haiyu.

Off-lying islands. — Dangers. — Mang chou (Mongchau) (*Lat. 21° 40′ N., Long. 112° 26′ E.*), an island, 916 feet (279m2) high, covered with verdure, lies near the edge of the coastal bank, about 12 miles east-south-eastward of Ta-ao-hsü. There is a village, only visible from south-eastward, near the summit. Rocks extend about 1½ miles north-eastward from the island. A rock, 30 feet (9m1) high, lies about one mile south-eastward of the island, with a rock, above water, between. Small vessels with local knowledge may anchor off the western side of this island, during easterly winds, in a depth of 3 fathoms (5m5); there is a beach on the western side of the island, near its southern end.

Hsia ch'uan shan (Haucheun) island, 1,822 feet (555m3) high, lies on the edge of the coastal bank, about 5 miles eastward of Mang chou. Between Haucheun bluff, the south-western extremity of a peninsula at the south-western end of the island, and a point on the western side, about 1¼ miles northward, there are two small bights with sandy beaches, where small vessels with local knowledge may take shelter during the North-east monsoon, in depths of 3 fathoms (5m5); larger vessels will be sheltered from easterly winds by anchoring about one mile westward of the southern bight, in depths of 5 or 6 fathoms (9m1 or 11m0), soft mud.

Nan-ao (Namo harbour) (page 447) is entered between the eastern extremity of the peninsula at the south-western end of Hsia ch'uan shan and a point about 3 miles east-north-eastward, close off which some sunken rocks lie. There is a bight between this point and the

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Chart 2212.

eastern extremity of the island, about 3¼ miles north-eastward. The coastal bank, with a depth of 3 fathoms (5m5) at its extremity, extends about 2 miles south-eastward from the head of this bight. The town of Haucheun is situated at the head of the bight.

A group of five islands lies off the south-eastern extremity of Hsia ch'uan shan. Round islet, the southernmost of the group, with a rock, above water, close south-eastward, lies about 2½ miles south-south-westward of the eastern extremity and 2 miles offshore. Boat rock, which dries 5 feet (1m5), and over which the sea usually breaks, lies about half a mile southward of Round islet. P'ing chou (Wasp), 252 feet (76m8) high, the largest island of the group, with some rocks close off its south-eastern side, lies about half a mile north-eastward of Round islet, and is separated from the coastal bank extending from the south-eastern side of Hsia ch'uan shan by a narrow passage. Kuan-yü chou (Cricket island), 307 feet (93m6) high, lies close northward of the eastern end of P'ing chou. P'i-p'a chou (Pipa chau), a grass-covered island, 170 feet (51m8) high, with rocks both above water and sunken, extending about 3 cables from its southern end, lies about 7⅛ cables from the eastern extremity of Hsia ch'uan shan. The northernmost island of the group lies about a quarter of a mile north-north-westward of P'i-p'a chou.

The group of five islands described above lie at the southern end of the western side of the channel (page 448), about one mile wide in its narrowest part, between Haucheun and Shang-ch'uan shan (St. John island). Vessels with a draught of 15 feet (4m6) will find sheltered anchorage between the islands and Hsia ch'uan shan, in a depth of 3 fathoms (5m5), soft bottom.

Chart 2212, plan of Namo harbour.

Nan ao.—Nan ao (Namo harbour) lies close eastward of the peninsula at the south-western end of Hsia ch'uan shan, and, although small, is safe and convenient for a vessel of shallow or even moderate draught.

Wang-fu chou (Namo island), 652 feet (198m7) high, lies on the south-eastern side of the harbour, about one mile eastward of the eastern extremity of the peninsula, and about half a mile off the southern side of Hsia ch'uan shan, to which it is connected by a bank, over which there is a depth of 3 fathoms (5m5) midway between the two.

Passage islet lies close off the south-western extremity of Wang-fu chou, connected to it by a reef; rocks extend to about half a cable westward from Passage islet.

The southern entrance to Nan ao lies between these rocks and the peninsula mentioned above. The eastern entrance, between Wang-fu chou (*Lat. 21° 35′ N., Long. 112° 34′ E.*) and the southern side of Hsia ch'uan shan, has a least depth of 3 fathoms (5m5) in the fairway, but is encumbered with fishing stakes.

The southern entrance, with a depth of 6 fathoms (11m0) in it, gradually decreasing towards a sandy beach at the head of the harbour, is preferable to the eastern entrance for vessels with a draught of more than 16 feet (4m9). On the eastern side of this entrance the western side of Wang-fu chou is fringed in places by sunken rocks, and between Green point, the north-western extremity of the island, and Passage islet, the coastal bank, with a depth of 3 fathoms (5m5) over it, extends about 2 cables offshore.

In the south-western approach to the eastern entrance of Nan ao,

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Chart 2212, plan of Namo harbour.

some rocks, both above water and sunken, extend about 3 cables from the south-eastern side of Wang-fu chou. Between a point about one mile north-eastward of the eastern extremity of Wang-fu chou and a point about 2 miles westward, the northern side of the eastern entrance is indented by two bays; the eastern bay, at the head of which there is a fishing village, is foul; Watering bay, the western of these two bays, is sandy, and dries. Barren island, connected to Hsia ch'uan shan by a drying reef, lies about 1½ cables southward of the western entrance point of Watering bay. The southern side of the eastern entrance is fringed by sunken rocks close offshore; there is a small bight, with a sandy beach, close eastward of Green point.

Between Barren island and a point about one mile west-north-westward, there is a bay with a sandy beach; Namo village, in which there is a post office, stands at the head of this bay. The north-western and south-western sides of the harbour are fringed by sunken rocks. At the western end of the harbour there is a narrow drying sandbank, which extends about 3½ cables offshore, with depths of 3 fathoms (5m5) and less over it.

During strong southerly winds there is considerable surf on the beach at the northern end of the harbour; then, if landing, it is advisable to do so at Watering bay.

Anchorages.—Directions.—With an easterly wind, the best anchorage is about half a mile offshore, midway between Passage islet and Green point, in a depth of 4½ fathoms (8m2), soft mud. When it blows strongly, a long ground-swell is experienced, rendering it necessary to anchor in the western part of the harbour, in a depth of 4¼ fathoms (7m8), mud.

The best berth for a small vessel is north-eastward of Green point, and abreast the sandy beach just eastward of that point; not so far northward as to open Green point (*Lat. 21° 36′ N., Long. 112° 33′ E.*) of the western entrance point of the harbour. In this berth there is a depth of not less than 3 fathoms (5m5) and, although slightly exposed to easterly winds, no swell of any consequence is felt.

When entering from southward vessels should give a berth of about 2 cables to Passage islet. Vessels approaching the eastern entrance from southward should give a berth to the rocks extending from the south-eastern side of Wang-fu chou. Vessels approaching the eastern entrance from eastward should pass southward of Boat rock; thence in mid-channel to the desired anchorage.

Chart 2212.

San Hsia k'ou and approach.—San Hsia k'ou (Gunjavar channel) is the passage between Shang-ch'uan shan and the south-eastern edge of the shallow coastal bank extending from the mainland. It is approached from southward by the channel entered between Round islet (page 447) and Shang-ch'uan chiao (St. John point), the southern extremity of Shang-ch'uan shan, about 7½ miles east-south-eastward. The five islands, described on page 447, lie on the western side of the southern part of the channel. On the eastern side of the channel, between Shang-ch'uan chiao and Sha-t'i chiao (Shito point), 3¼ miles north-westward, there are two small bays; some rocks, which are steep-to, extend for about 1½ cables from the southern entrance point of Ta-tien wan, the southern bay. Sha-t'i wan, the northern of these two bays, is described on page 449. Ta wan (Sandy bay) is entered

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Chart 2212.

between Sha-t'i chiao (*Lat. 21° 37′ N., Long. 112° 43′ E.*) and a point about 5 miles north-north-westward; it is shallow and its head dries.

On the western side of the channel, there is a shallow bight between the eastern extremity of Hsia ch'uan shan and a point about 2½ miles northward. Huang-ching chou, 471 feet (143m6) high, lies about 6½ cables off the north-eastern end of Hsia ch'uan shan. A rock, 18 feet (5m5) high, lies about 4 cables northward of Huang-ching chou.

For a distance of from one to 6 miles north-eastward of the south-western entrance, San Hsia k'ou is about one mile wide, with depths of 2¼ fathoms (4m1) on the edge of the coastal bank which forms its north-western side; eastward of this, the channel is about 4 miles wide.

On the south-eastern side of the channel, a peninsula, the extremity of which, named Huang-mao t'ou, is situated about 6 miles north-eastward of the western extremity of Shang-ch'uan shan, divides the north-western side of that island into two shallow bays. San-chou wan, the south-western bay, is encumbered with islets; the village of San-chia-t'sun (Samtong), in which there is a large monastery and where some provisions can be obtained, stands on the eastern side. P'ing chou, 58 feet (17m7) high, lies about 8½ cables northward of the western entrance point of San-chou wan, with another islet, 48 feet (14m6) high, about 1¾ cables south-eastward of it.

Chart 2562.

San Hsia k'ou is entered from eastward between the north-eastern extremity of Shang-ch'uan shan and the southern extremity of Tongkwa (page 446), about 5 miles north-north-eastward. Some rocks, awash or above water and steep-to, lie about 6½ cables off the north-eastern extremity of Shang-ch'uan shan and some sunken rocks lie a short distance off the southern extremity of Tongkwa.

Chart 2212.

Anchorages.—Vessels can find shelter, according to the prevailing wind, in the southern part of the approach to San Hsia k'ou, in depths of from 5 to 6 fathoms (9m1 to 11m0), soft ground.

A vessel will find good shelter during bad weather either northward or southward of the western extremity of Shang-ch'uan shan, according to the wind; farther southward she would be exposed to southerly winds.

San Hsia k'ou would probably make a good typhoon anchorage; the bottom consists of soft mud.

Chart 2212, plan of Shito bay.

Sha-t'i wan.—Anchorages.—Sha-t'i wan (Shito bay) is entered between Sha-t'i chiao (*Lat. 21° 37′ N., Long. 112° 43′ E.*) and a point, about 1½ miles east-south-eastward. The sides of the bay, backed by steep hills, are rocky, except for one or two sandy beaches. Some rocks, both above and below water, lie close off Sha-t'i chiao. Mei-t'ou chou, with sunken rocks extending about one cable off its northern side, lies about 4 cables east-south-eastward of Sha-t'i chiao and 1½ cables offshore. A rock, which dries 5 feet (1m5), with sunken rocks close off its north-western side, lies near the head of the bay, about 1¾ miles east-north-eastward of Sha-t'i chiao and one cable offshore. Sha-t'i hsü (Satie) stands at the head of the bay.

Anchorage is indicated on the chart, in the approach, about 6½ cables south-south-eastward of Sha-t'i chiao. There is also anchorage with the 5-foot (1m5) high rock bearing 050°, distant about three-quarters

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Chart 2212, plan of Shito bay.

of a mile, in a depth of 5 fathoms (9m1). This anchorage is well sheltered except from south-easterly, southerly, and south-westerly winds, which cause a swell.

Large junks anchor off Sha-t'i hsü.

Chart 2212.

Shang-ch'uan shan and off-lying islands.—The south-western and north-western sides of Shang-ch'uan shan (St. John island) have been described on page 448. Wei-chia shan (Waikaup), a rocky island, 676 feet (206m0) high, is separated from the south-western end of Shang chu'an shan by a passage about 2 cables wide, bordered by high cliffs.

Wu-chu chou (Liuchiu), an island, 783 feet (238m7) high, and barren aspect, is separated from the south-eastern end of Shang-ch'uan shan by a channel, about 2¾ miles wide, with a depth of about 12 fathoms (21m9). An islet, 225 feet (68m6) high, lies close off the north-western end of Wu-chu chou.

A reef, on which the sea breaks at times and the position of which is doubtful, lies about 2½ miles northward of Wei-chia shan and half a mile off the eastern side of Shang ch'uan shan. Chung-hsin chou lie about 1½ miles from a point, about 2 miles northward of this reef.

Ch'a wan (Sanki) and Pei wan (Chauwan) bays lie between the last-mentioned point and the north-eastern end of the island. Erh P'ai, which dries 7 feet (2m1), lies about 3 cables off the north-eastern entrance point of Pei wan.

Tidal streams.—Outside the islands lying off this part of the coast, the tidal streams set eastward and westward, at rates of from 1½ to 2 knots. Inside, they attain a greater rate.

Chart 2562.

APPROACH TO TAM KONG.—Islands.—Several islands lie in the approaches to Tam Kong, or South-west river, which is described on page 525.

Ta-chin (Taikam), an island, lying about 10 miles north-eastward of Shang ch'uan shan, has four peaks, the highest of which has an elevation of 1,289 feet (392m9) and is situated on its eastern side. It is of dark aspect, and, in clear weather, red streaks are visible on it. In the southern part, in a small bay behind a mound of sand near the beach, there is a village. There is also a small bay, close westward of the north-eastern extremity of the island, in which is a leper colony. Between this island and the mainland, about 2¼ miles north-westward, the depths are less than 2 fathoms (3m7). A rock, 13 feet (4m0) high, lies close off the southern extremity of Ta-chin.

Fan-kuei-luan (White Wizard) (*Lat. 21° 50′ N., Long. 113° 02′ E.*), an islet, 141 feet (43m0) high, and White (South) Wizard, 249 feet (75m9) high, lie about one mile south-eastward and 2¾ miles southward, respectively, of the southern extremity of Ta-chin. Three-quarters of a mile south-westward of Fan-kuei-luan there is a rock, 8 feet (2m4) high. A rocky islet, 52 feet (15m8) high, with a rock, which dries 7 feet (2m1), about 2 cables south-south-westward, lies about 9 cables west-north-westward of Fan-kuei-luan.

Ch'ing-ying (The Flies), about one mile southward of White Wizard, consist of a group of rocks about 115 feet (35m0) high. They should be given a wide berth, as the area for a considerable distance southward of them has not been surveyed.

Charts 2661a, 1263.

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Chart 2562.

Ho-pao (Kukok ngao kok), an island, 1,263 feet (385^{m}0) high, lies about 5 miles eastward of Ta chin ; a rock, 15 feet (4^{m}6) high, lies close off the southern extremity of Ho-pao. The northern side of the island is indented by two bays ; there is a large fishing village at the head of the western bay. Under the high western side of the island, there is good anchorage, with shelter from north-easterly winds, in a depth of 5 fathoms (9^{m}1), about 1½ miles offshore.

Kao (Kau) lan, an island, 1,375 feet (419^{m}1) high, lies about 2½ miles north-eastward of Ho-pao. Sunken rocks fringe the south-eastern side of Kao lan in places, and there is a rock, which dries 4 feet (1^{m}2), about half a mile north-eastward of the southern extremity and one cable offshore. A sand slide, on the north-eastern side, is prominent from eastward. Wen chou (Sam long), an islet, 276 feet (84^{m}1) high, lies three-quarters of a mile eastward of the eastern extremity of Kao lan ; Yüan chou (Yuang islet), 167 feet (50^{m}9) high, lies about a quarter of a mile northward of Wen chou, with a rock above water between.

A channel runs in a north-westerly direction between Ho-pao and Kao lan. On the south-western side of this channel Ta-mang (Tai Mong), an island, 901 feet (274^{m}6) high, lies about 2 miles north-westward of Ho-pao, with a least depth of 2 fathoms (3^{m}7) between. A group of rocks, 3 feet (0^{m}9) high, lies about half a mile westward of Ta-mang. Samkok, 225 feet (68^{m}6) high, is the southernmost of a group of islets extending about half a mile south-south-westward from the southern extremity of Ta-mang.

T'a chou (Robin island) (*Lat. 21° 57′ N., Long. 113° 08′ E.*), 276 feet (84^{m}1) high, with a rock, 18 feet (5^{m}5) high, 2 cables south-eastward, lies about 8 cables north-westward of Ta-mang.

On the north-eastern side of the channel, San-chiao (Rusty island), 449 feet (136^{m}9) high, lies about one mile north-eastward of Ta-mang. A rock, 7 feet (2^{m}1) high, lies about a quarter of a mile westward of San-chiao, and there is a rock, 3 feet (0^{m}9) high, close off its south-eastern end.

This channel affords anchorage for small craft, while there is also good anchorage for vessels with a draught up to 17 feet (5^{m}2), in the North-east monsoon, in the north-western of two bays on the south-western side of Kao lan, over a mud bottom.

Yü-chia-wan ting (Sam hoi chuk), 812 feet (247^{m}5) high, joined to Ta-lin (Lam puk sui), on the mainland, by reclaimed land, lies about 2½ miles north-westward of Kao lan. A bank, with a depth of less than 6 feet (1^{m}8) over it, extends about 2½ miles south-eastward from the south-eastern side of Yü-chia-wan ting, leaving a narrow channel, in the fairway of which is a depth of 9 feet (2^{m}7), between it and the north-western side of Kao lan.

San Tsao (chau), an island, 1,003 feet (305^{m}7) high, lying on the western side of the approach to the Hsi chiang, is situated about 4 miles north-eastward of Kao lan. In the shallow area between Kao lan, San Tsao and Yü-chia-wan ting are Po chou (Pog islet), 25 feet (7^{m}6) high, 9 cables south-eastward of the south-eastern extremity of Yü-chia-wan ting, San-ya shih (Pawn islets), 27 feet (8^{m}2) high, 1¼ miles south-eastward of Po chou, and Ching chou (Ta long kong), 236 feet (71^{m}9) high, about 8 cables eastward of San-ya shih. A rock, which dries 2 feet (0^{m}6), lies about 3 cables north-westward of Ching chou.

Charts 2212, 2661a, 1263.

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Chart 2562.

Between Yü-chia-wan ting, San Tsao and the southern end of Ta-lin are Hung-k'an-shan chou (Ming islet), 272 feet (82m9) high, close off the north-western end of San Tsao, Ta-mu-nai (Chop islet), 187 feet (57m0) high, three-quarters of a mile southward of the south-eastern end of Ta-lin and at the southern end of a drying bank which extends from that end of Ta-lin, and Chip islet, 59 feet (18m0) high, 3 cables westward of Ta-mu-nai.

There are numerous villages on San Tsao.

Vessels with local knowledge, with a draught of 7 feet (2m1), can proceed through the channel which passes about 5 cables eastward of Ching chou, and thence between Ta-mu-nai and the south-eastern end of Ta-lin on the north-western side and the western side of San Tsao and Hung-k'an-shan chou on the south-eastern side.

Nam sui harbour, in the approach to which there is a depth of 3 feet (0m9), is entered between the north-eastern end of Yü-chia-wan ting and a point on Ta lin about half a mile northward.

Entrance.—The entrance to the Tam kong is the area between Ta-chin and Kao lan, at the southern end, and the mouths of Yai-men (page 525) and Hu-t'iao men (Fu tiu mun) at the northern end, 20 miles northward of Ta-chin.

The western shore of the entrance extends from Kok tsui shan, situated on the mainland about 4 miles northward of Ta-chin, for a distance of about 10½ miles northward, thence 7 miles north-eastward to Yai-men.

Off the western shore are numerous islands, chief among them being Wong mau, 179 feet (54m6) high, which is 6½ miles northward of Ta-chin, and Tuk ngi, 152 feet (46m3) high, about 5 miles farther northward. Ch'ih-Pi (Chek bay), an islet, lies about 3¼ miles east-north-eastward of Tuk ngi on the eastern side of a spit, with depths of less than 6 feet (1m8) over it, which extends about 9 miles southward from the western entrance point of Yai-men. Drying patches lie on this spit north-north-westward of Ch'ih-Pi, and there is a drying patch about 1½ miles southward of the islet. There are numerous well-populated and apparently prosperous villages on this shore.

The eastern shore is not so well defined, but is marked by reclaimed land and mudbanks extending 6 miles north-westward from Yü-chia-wan ting to E fu. From E fu the shore runs northward for 7 miles to the mouth of Hu-t'iao men.

San hu (Sam fu), 77 feet (23m5) high, lies close off E fu. Fu Fu, 14 feet (4m3) high, lies on the outer edge of the mudflat fringing the coast, about 4 miles northward of E fu and three-quarters of a mile offshore. Sui lu chu, another islet, lies close off the southern entrance point of Fu tiu mun.

An area, south-westward of San hu, has a rocky bottom, totally different from the general nature of the bottom in this area, which is soft mud. This area is close eastward of the deep channel, and, if in doubt, it is advisable to keep to the western side of the fairway.

Tzu-chi shan (Cone hill), 1,079 feet (328m9) high, and very prominent, lies 4½ miles north-eastward of San hu (*Lat. 22° 04′ N., Long. 113° 06′ E.*).

Puk sui, the only village of any importance on the eastern shore, is situated, on the south-western end of Ta-lin, about 6 miles east-south-eastward of San hu.

Charts 2212, 2661a, 1263.

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Chart 3588.

Yai-men leads to the Tam kong, about 13 miles northward of its mouth, and is also connected by narrow creeks to the Hsi chiang.

On the western shore, at the mouth of Yai-men, there is a conspicuous white square tower. There is a similar tower on the southern extremity of the mainland separating the mouths of the Yai-men and Hi-t'iao men; close to the tower, but at a lower level, is a Chinese Maritime Customs station, with a flagstaff. This station, which is whitewashed, is very prominent and can be distinguished before the tower.

A spit, with a depth of only 2 feet (0m6) at its extremity, extends about three-quarters of a mile southward from the mainland between the two mouths. Vessels proceeding from one pass to the other should hold well southward before turning.

Hi-t'iao men is very much shoaler and narrower than Yai-men, but it is the only passage available from this neighbourhood to the Hsi chiang, and is invariably used by vessels proceeding to Chiang-men (Kongmoon) (page 535).

Yai-men and Hi-t'iao men are described on pages 525 and 528, respectively.

Chart 2562.

The Broadway, which is the main entrance to the Hsi chiang (Si kiang), and which is entered between San Tsao and Ta-heng-ch'in (Wong kum), an island, about 4 miles east-north-eastward, is described on page 529.

Chart 1180.

Tahsi shuitao or Great West channel, entered from south-westward between Ta-heng-ch'in and Hsiaoputai (*Lat. 22° 02′ N., Long. 113° 38′ E.*), the westernmost of Wanshan chuntao (Ladrone islands), about 5½ miles south-eastward, is described on page 574.

Charts 2212, 2661a, 1263.

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CHAPTER X

APPROACHES TO HONG KONG—HONG KONG HARBOUR

Chart 1180.

APPROACHES TO HONG KONG.—Islands.—Between Hsiao-putai or Potue (*Lat. 22° 02′ N., Long. 113° 38′ E.*) (page 457) and the western entrance point of Mirs bay, about 47 miles north-eastward, a large number of islands and dangers lie in the approaches to Hong Kong, and also to Canton (page 615).

The islands are mostly divided into groups; Wanshan chuntao or Ladrone islands (page 457) being the principal group in the south-western approach. Chiapeng chuntao or Kaipong islands (page 455), about 12 miles south-eastward of Wanshan chuntao, and Lima chuntao or Lema islands, about 5 miles north-eastward of Chiapeng chuntao, are the outer groups in the southern approach. *See* views facing this page.

Sanmen or Sa mun group (page 459), with Yai chou or Ai chau islands (page 459), about 2½ miles westward, lies about 7½ miles northward of Chiapeng chuntao. Wailingting or Lingting island (page 459) lies about 2½ miles north-eastward of the Sanmen group.

Lantao or Tai-yu-shan (page 460), with several islands lying a short distance off its eastern side, lies about 6½ miles north-westward of Wailingting. Several small groups of islands lie between the south-western end of Lantao and Wanshan chuntao; these groups are described on pages 580-581.

Hong Kong island, with Pok liu chau (page 465), situated one mile off its south-western side, and the Po toi group (page 471), about the same distance off its south-eastern end, lies about 5 miles eastward of Lantao, and close off the mainland.

The Ninepin group of islands, lying off the mainland eastward of Hong Hong, are described on page 474.

Climate and weather.—*See* page 36.

Submarine exercise area.—*See* page 460.

Channels.—Vessels approaching Hong Kong from south-westward can pass between Wanshan chuntao, Yai chou, Sanmen and Wailingting on the north-west, and Chiapeng chuntao and Lima chuntao on the south-east. Vessels approaching from southward can pass southward and eastward of Chiapeng chuntao and Lima chuntao, or can pass between these groups through Tai Ta Mi channel (page 456).

Vessels can pass either eastward or westward through Lema channel (page 471), between Lima chuntao and the Po toi group.

Hong Kong harbour lies between the northern side of Hong Kong

Charts 3026, 1962, 2661a, 2661b, 1262, 1263.

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Chart 1180.

island and the mainland, and can be entered either from westward or eastward. There is a depth of 4 fathoms (7m3) in the fairway of the western entrance, and 6 fathoms (11m0) in the eastern. Vessels approaching the western entrance can pass through West Lamma channel (page 462), between Lantao and Hong Kong island, or through East Lamma channel (page 465) between Hong Kong island and Pok liu chau. Vessels approaching the eastern entrance pass eastward of the Po toi group and through Tathong channel (page 474), between the north-eastern side of Hong Kong island and the mainland.

Vessels with a draught not exceeding 34 feet (10m4) may use the eastern entrance, and those not exceeding 24 feet (7m3) the western entrance.

Chiapeng chuntao.—Dangers.—Wenwei chou or Gap rock (*Lat. 21° 49′ N., Long. 113° 56′ E.*), 97 feet (29m6) high, is the south-westernmost of Chiapeng chuntao; several sunken rocks extend one cable from the rock. Huangmao chou or Jubilee islet, 218 feet (66m4) high, lies about one mile north-eastward of Wenwei chou, separated by a deep channel. Wan chou, or Fryer islet, 212 feet (64m6) high, and Chan chou or Nut islet, 295 feet (89m9) high, lie about 3 and 9 cables, respectively, north-eastward of Huangmao chou. Ping chou or Reef islet, 90 feet (27m4) high, with a rock, awash, close off its southern extremity, lies about 6 cables south-eastward of Huangmao chou. Bow islet, 219 feet (66m7) high, lies about 3 cables eastward of the southern end of Wan chou. Peaked rock, 114 feet (34m7) high, with rocks close off its southern side, lies about one mile eastward of Bow islet.

Wengyaishan Ting or Tsi-mi-wan, 746 feet (227m4) high at its northern end, lies about 1½ miles northward of Peaked rock. Chiung chiung wei and Huachouwei, 202 and 107 feet (61m6 and 32m6) high, respectively, lie close together close off the southern end of Wengyaishan Ting, and two sunken rocks, on the outer of which the sea breaks, lie close off the north-eastern extremity of the same island.

Paipai or Rugged rock, 80 feet (24m4) high, lies about one mile off the western side of Wengyaishan Ting.

Pei Chien or Pak-Tsim, the largest and north-easternmost of Chiapeng chuntao, lies north-eastward of Wengyaishan Ting, separated by a channel about half a mile wide. Ass's Ears, two remarkable peaks near the south-western end of Pei Chien, rise almost perpendicularly to an elevation of 985 feet (300m2) and, falling abruptly on the north-eastern side, unite with the moderately high land which forms that part of the island. On the southern side of the island there is a small bay, on the western side of which there is an islet, 128 feet (39m0) high. A rock, 19 feet (5m8) high, lies close off the northern extremity of the island and, at its north-eastern end there is a bay, with a rock, 25 feet (7m6) high, and another one foot (0m3) high, lying close off the western entrance point. Kueitou shih or Kwei-tau, a white rocky islet, 110 feet (33m5) high, lies about three-quarters of a mile eastward of the eastern extremity of Pei Chien, with a rock, awash, on which the sea breaks, between them. A 7½-fathom (13m7) patch lies 8 cables westward of the western extremity of Pei Chien.

Oyen shih or Gai une, a rock, 127 feet (38m7) high, lies about one mile northward of Pei Chien. Lihsinpai or Cambridge rock, with a depth of 2½ fathoms (4m1) over it, and on which the sea breaks only

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Chart 1180.

in heavy weather, lies one mile north-eastward of Oyen shih. Lihsinpai lies on the south-western side of Tai Ta Mi channel.

Light.—Fog signal.—A light is exhibited, at an elevation of 140 feet (42m7), from a white tower on the eastern corner of a dwelling, 62 feet (18m9) in height, on Wenwei chou. In 1950, the light was extinguished. *See* view facing page 61.

A fog signal is sounded from the lighthouse.

Storm and other signals.—There is a signal station on Wenwei chou with which vessels can communicate by the International Code of Signals; there is radio communication between the lighthouse and Hong Kong, and passing vessels are reported.

When local storm signals are displayed at Hong Kong, supplementary signals are displayed at Wenwei chou. *See* page 498.

The following is an extract from the Hong Kong Merchant Shipping Ordinance of 1899:—

"The Master of every merchant ship arriving within signalling distance of the signal station at Wenwei chou or Wang lan, and intending to enter the port, shall hoist the National Colours and the House Flag or the number of the ship, and shall keep the same flying while passing the signal station. He shall also hoist the National Colours of the ship when entering the port, and shall keep the same flying until the ship has been entered at the Director of Marine's office."

Lima chuntao.—Dangers.—Lima chuntao or Lema islands are five islands lying north-eastward of Chiapeng chuntao, separated by Tai Ta Mi channel, which is deep and about 3 miles wide. Lima chuntao are all steep-to, and there are no off-lying dangers except Mosquito and Iroquois rocks. Boats may find shelter at various places on the northern sides of the islands, but the southern sides provide no shelter except southward of Chih wan or Puntin, between that island and Hsitan or Tai Ta Mi. Notwithstanding their broken appearance, the three main islands, Tankan shan or Tamkan, Erh chou or Ye chou, and Chih wan, are sparsely inhabited. Fishing appears to be the only occupation. *See* views facing this page.

Hsitan (*Lat. 21° 58′ N., Long. 114° 08′ E.*), 451 feet (137m5) high at its eastern end, rocky and precipitous, is the south-westernmost of Lima chuntao and lies 4¾ miles north-eastward of Pei Chien, and on the north-eastern side of Tai Ta Mi channel.

Mosquito rock, with a depth of 8 feet (2m4) over it, lies about 1½ cables southward of the south-western extremity of Hsitan; the sea breaks on this rock, except during very calm weather.

Chih wan lies northward of Hsitan, separated by a deep channel about half a mile wide; it has four distinct peaks, the highest of which has an elevation of 1,237 feet (377m0). Near the middle of the northern side of the island is Rock A, the extremity of a projection, westward of which small vessels may find shelter from the North-east monsoon, but this anchorage is not recommended as the holding ground is uncertain.

Iroquois rock, a pinnacle with a depth of 32 feet (9m8) over it, lies about 9 cables south-westward of Ta Tanwei or Ichau head, the western extremity of Chih wan.

Erh chou, 1,556 feet (474m3) high, when viewed from most directions, appears flat-topped; it lies eastward of Chih wan, separated by Erh men or Yechau channel, which is deep and about 4 cables wide; it is

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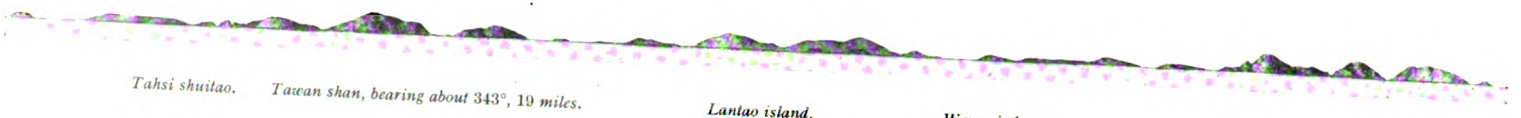
To face page 456.



Wanshan chuntao and Lima chuntao from southward.

(*Original dated* 1865.)

Lima chuntao from eastward.

(*Original dated* 1864.)

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Chart 1180.

clear of dangers. Round island, 139 feet (39m6) high, lies about 2 cables north-westward of the north-eastern extremity of Erh chou.

Tankan shan, the largest and easternmost of Lima chuntao, is 1,045 feet (318m5) high near its middle and lies north-eastward of Erh chou, separated by I men or Yat mun, about 6 cables wide; there are depths of over 12 fathoms (21m9) in I men and it is clear of dangers. Tankantou wan or Joss house bay is situated at the eastern end of the northern side of Tankan shan, and provides excellent shelter for small vessels during the North-east monsoon. Anchorage may be obtained, in a depth of about 8 fathoms (14m6), with good holding ground. Eddies occur off Sanyashih tsui or North-east head, the north-eastern extremity of Tankan shan.

Lema channel, northward of Tankan shan, is described on page 471.

Wanshan chuntao.—Dangers.—Wanshan chuntao or Ladrone islands are the southernmost of a large number of islands which lie in the southern approach to Chu chiang between Tahsi shuitao or Great West channel, on the western side, and Lantao channel, on the north-eastern side. The islands are useful landmarks for vessels approaching Hong Kong or Canton from south-westward. *See* views facing page 456.

Tawan shan or Great Ladrone, steep, bold and rocky, is the southernmost of Wanshan chuntao, and lies about 13 miles north-westward of Wenwei chou (page 455). The north-western part of the island is dome-shaped and is 1,424 feet (434m0) high; the appearance of the island differs from all the others in the group, although most of them are high. Wanshan wan or Pumice Stone bay is a small inlet at the south-western end of the island, where fishing boats shelter during the North-east monsoon. An islet lies close off a village at the head of the inlet. For anchorage, *see* page 458.

Hsiao Wan shan or Little Ladrone (*Lat. 21° 57′ N., Long. 113° 41′ E.*), 835 feet (254m5) high, lies west-north-westward of Tawan shan, separated by Nanping men, a deep channel, about 3½ cables wide. Rocks lie close off the south-eastern extremity of Hsiao Wan shan, and a rock, 65 feet (19m8) high, lies about one cable off its north-eastern end.

A rock, with a depth of less than 6 feet (1m8) over it, lies about 6 cables westward of the south-western extremity of Hsiao Wan shan.

Yamu Pai or Black rock, which dries 5 feet (1m5), lies in the northern approach to Nanping men, half a mile northward of the north-eastern extremity of Hsiao Wan shan.

Hsiaoputai or Potue, 190 feet (57m9) high and sloping, lies about 5 miles north-westward of Hsiao Wan shan. Huangmao or Wongmu, 370 feet (112m8) high, with a peaked hill, 340 feet (103m6) high at its northern end, lies 1½ miles eastward of Hsiaoputai; about 3½ cables westward of the middle part of Huangmao is Pai Pai or Rock islet, 40 feet (12m2) high. Talieh or Liungnib, 450 feet (137m2) high, lying about one mile eastward of Huangmao, has Lianglieh Pai or Test rock, which dries 4 feet (1m2), 2 cables northward of it, and Hsiaolieh, a round islet, 410 feet (124m9) high, close off its southern end.

Tungao or Tong ho, 585 feet (178m3) high, lies about 1¼ miles east-south-eastward of Huangmao, being separated by Huangmao men. Nansha wan or Namsha bay is an indentation on the south-western coast of Tungao and affords shelter during the North-east monsoon.

Charts 3026, 2562, 2212, 1962, 2661a, 2661b, 1262, 1263.

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Chart 1180.

A rock, with a depth of 1¾ fathoms (3m2) over it, lies about 4 cables north-westward of Changtsui chiao or Barnard head, the south-western extremity of Tungao, and about 1½ cables offshore. There is a sandy beach at the head of Nansha wan.

Pei yen or North rock, awash and steep-to, lies about 2 cables off the north-eastern extremity of Tungao, in the northern approach to Tangao wan or Boddam cove, which is situated on the north-eastern side of the island; a rock, with a depth of 1¾ fathoms (3m2) over it, and steep-to, lies in the eastern approach to the same cove, about 8 cables east-south-eastward of the north-eastern extremity of Tungao.

The land on either side of Tangao wan rises steeply and terminates in a valley at the head of the cove, where there is a sandy beach. A reef, on which are some rocks above water, extends about one cable from the south-eastern entrance point. Within the entrance points both sides of the cove are fringed by rocks, with rocks, both above water and awash, lying at short distances off them in places. The tidal streams set north-westward and south-eastward outside the entrance, fairly strong, but the streams are weak inside.

Paili or Pak Leak (*Lat. 21° 59′ N., Long. 113° 45′ E.*), 995 feet (303m3) high, lies about 1½ miles south-eastward of Tungao, being separated by Laiwan men. On the north-eastern part of Paili is a remarkable conical hill. The hills on the southern side of the island are studded with black rocks. On the eastern side of the island, about 9 cables southward of Wantza chiao or Wedge point, the north-eastern extremity, there is a cove where fishing junks shelter; its northern side is indented by small bays, and rocks above water lie close off it in places.

House islet, which is 107 feet (32m6) high, and rocky, and close eastward of which is a sunken rock, lies about 2 cables northward of Wantza chiao. Shihpai Chico or Clio rock, with a depth of less than 6 feet (1m8) over it, lies about half a mile southward of the north-western extremity of Paili and 2 cables offshore. A rock, awash, lies close off Pingkang or South head, the southern extremity of Paili.

Kuei chou or Hoa Ok, 345 feet (105m2) high, lies about 1¾ miles north-eastward of Pingkang and 7 cables from the eastern side of Paili. A rock, with a depth of 7 fathoms (12m8) over it, lies nearly midway between Pingkang and Kuei chou, in the southern entrance to the channel between the two islands.

Raleigh rock, with a depth of 2 fathoms (3m7) over it, and on which the sea breaks at low water springs when there is a moderate sea, lies about 1¾ miles northward of House islet.

Tungtou shih or Skyrme rock, which dries 6 feet (1m8), and has depths of from 8 to 9 fathoms (14m6 to 16m5) around, lies about 4¼ miles north-north-eastward of Paili.

Sanya Pai or White rocks, about 1½ miles north-westward of Tungtou shih, consist of three rocks, the northern and highest having an elevation of 63 feet (19m2), and some sunken rocks.

Heng chou or Chuk chau, 392 feet (119m5) high, lies about 1¾ miles east-north-eastward of Paili. Chu chou or Chuk Wan shan, 574 feet (175m0) high, lies about 3 cables eastward of Heng chou. There is a small bay on the northern side of Chu chou, and Choutzu or Sharp islet, 185 feet (56m4) high and rocky, lies close off the south-eastern side of the island.

Anchorages.—Off the entrance to Wanshan wan, in Tawan shan

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Chart 1180.

(page 457), there is good anchorage for small vessels, during the North-east monsoon, with the islet at the head of the bay bearing 070°, distant about 4 cables, in a depth of 12 fathoms (21m9), mud.

There is good anchorage for small craft, during the North-east monsoon, off the bight in the south-western side of Huangmao (page 457), about 2½ cables south-eastward of Pai Pai, in a depth of about 7 fathoms (12m8), mud.

Tangao wan affords good shelter at all times to small vessels with local knowledge; although open to the North-east monsoon the swell does not enter the cove. A vessel can be run into the mud towards the head of the cove without risk.

There is good anchorage for small vessels during the North-east monsoon with the summit of Chu chou, bearing 095°, distant 6 cables, in a depth of 10½ fathoms (19m2), mud.

Yai chou.—Dangers.—Yai chou or Ai chau, consisting of two islands, lie about 4¼ miles north-eastward of Chu chou. Yai chou or Ai chau, the eastern and larger island, 721 feet (219m8) high, is separated from the smaller by Yaichou men, a very narrow channel, in the fairway of which there is a depth of 4 fathoms (7m3). A rock, which dries 4 feet (1m2), lies close off the western side of Yai Choutzu, the western island, and a sunken rock lies close off the northern end of the same island. A rock, which dries 5 feet (1m5), lies close off Peichiao tsui, the northern extremity of Yai chou.

Toulu chou or Hill islet (*Lat. 22° 04′ N., Long. 113° 56′ E.*), 121 feet (36m9) high, and surrounded by rocks, the highest of which has an elevation of 52 feet (15m8), lies about 1½ miles north-north-eastward of Yai chou.

Sanmen.—Dangers.—Sanmen or Sa mun is a group of islands lying eastward of Yai chou, separated by a channel about 2½ miles wide; there are deep channels between the islands of the group.

Hei chou or Hak chau, the north-westernmost of the group, is 328 feet (100m0) high. Makang, 77 feet (23m5) high, and Yuankang, 147 feet (44m8) high, known also as Peaked islets, lie within 3 cables of the northern end of Hei chou. The middle island of the group is 329 feet (100m3) high; on its western side is Sanmen wan. A 6¾-fathom (12m3) patch lies about 2 cables northward of the north-western extremity of this island. Some rocks, one of which dries 7 feet (2m1), lie close off the eastern extremity of the middle island, and San Men chou or Gauze islet, 211 feet (64m3) high, and rocky, lies about 4 cables farther north-eastward. Heng kaug chou or Hungkong chau, the south-easternmost of the group, has a round hill, 460 feet (140m2) high, at its southern end. Chuwantou or Chik wan, 239 feet (72m8) high, lies close northward of Heng kaug chou. There is a rock, above water, close northward of Chuwantou.

Anchorage.—Sanmen wan affords shelter to small vessels during north-easterly winds, in depths of from 6 to 10 fathoms (11m0 to 18m3), mud.

Wailingting.—Dangers.—Wailingting or Lingting lies about 3 miles north-eastward of Sanmen; it has a rugged appearance and rises to a peak, 1,026 feet (312m7) high, near its centre. There is a natural enclosed boat harbour on the western side of the island, and the north-western extremity of the island is low and rocky.

Needle rocks, two pinnacles close together, with depths of 5 feet

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Chart 1180.

(1m5) over them, lie about 1½ cables south-westward of the north-western extremity of the island. A rock, 9 feet (2m7) high, with a rock, having a depth of less than 6 feet (1m8) over it, close southward, lies about three-quarters of a mile eastward of the northern extremity of the island and half a mile offshore. A rock, which dries 2 feet (0m6) and is steep-to, lies about 2 cables northward of the 9-foot (2m7) high rock.

Vessels should give the north-eastern side of the island a wide berth, especially at night.

The groups of islands extending south-westward from Lantao, and which lie north-westward of the line joining Wanshan chuntao and Wailingting, are described on pages 575-576 and 580-581.

Charts 3605, 1180.

Submarine exercise area.—A submarine exercise area, indicated by a cautionary note on the charts, lies in the southern approach to Hong Kong between the parallels of 21° 30′ N. and 22° 10′ N. and the meridians of 114° 00′ E. and 114° 30′ E.

Chart 1180.

LANTAO.—Eastern part of southern side.—Dangers.—Light.—Lantao or Tai yu shan, lies westward of Hong Kong island. The island is high, and about its centre are several peaks; Lantao peak, the summit, 3,065 feet (934m2) high, lies about 10 miles north-north-westward of Wailingting.

Between a rounded point, 537 feet (163m7) high, situated on the coast about 2½ miles southward of Lantao peak, and a point about 3 miles eastward, there is a bay, with depths in the entrance of about 4 fathoms (7m3) gradually decreasing towards the shore. The eastern side of this bay is formed by a rugged peninsula which rises to a jagged summit, 996 feet (303m6) high, forming the south-eastern end of Lantao. Villages are situated near both the western and eastern shores of the bay.

Rocky islet (*Lat. 22° 13′ N., Long. 113° 57′ E.*), 95 feet (29m0) high, lies about 8 cables eastward of the western entrance point of the bay. Mid rocks, a group of small wedge-shaped rocks, which dry 4 feet (1m2), lie about one mile north-eastward of Rocky islet and half a mile offshore.

The southern side of Lantao, westward of this bay, is described on page 581. The north-western side of Lantao is described on page 589.

Shek ku chau lies southward of the peninsula forming the south-eastern end of Lantao, from which it is separated by a channel about 6 cables wide. This island has two peaks, of which the north-western, surmounted by large boulders, is 609 feet (185m6) high, and the south-eastern 511 feet (155m8). A ledge of rocks, 7 feet (2m1) high, lies about 1¾ cables off the north-western side of the island, with a narrow channel between, in the fairway of which there are depths of from 2 to 3 fathoms (3m7 to 5m5).

The northern end of Cheung chau is separated from the south-eastern end of Lantao by a channel about half a mile wide, near the middle of which is a rock which dries 2 feet (0m6).

Cheung chau consists of two portions, joined by a narrow neck of sand, on which a fishing village is situated. The northern portion

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Chart 1180.

is 350 feet (106m7) high and the southern portion 238 feet (72m5). The bay on the western side of the narrow neck appears to afford good shelter, but it is generally so full of junks that there is little room for even a small vessel.

The island is connected by telephone to Hong Kong and a regular ferry service is maintained.

The eastern side of Cheung chau is described on page 463.

A light is exhibited, at an elevation of 16 feet (4m9), from a concrete structure with black, white and red bands, 16 feet (4m9) in height, on the rock in the channel between Cheung chau and Lantao.

Submarine cables.—Beacons.—Submarine cables are laid between the north-western extremity of Cheung chau and the south-eastern extremity of Lantao. The eastern and western limits of the area in which the cables are laid are marked by two beacons on Lantao and two on Cheung chau. *See* page 25.

Storm signals.—When local storm signals are displayed in Hong Kong harbour, supplementary signals are displayed at Cheung chau police station (*see* page 498).

Eastern side.—Dangers.—Between the eastern extremity of the peninsula forming the south-eastern end of Lantao and a point about 2 miles northward, the coast is indented by two bays. The southern bay is shallow in its south-western part and dries at its head; a rock, with a depth of less than 6 feet (1m8) over it, lies about one mile west-north-westward of the southern entrance point of this bay and close offshore.

The land at the head of Ngang Kong, the northern bay, is cultivated and three villages are situated a short distance inland. A prominent tall chimney stands near the head, and on the northern side of this bay, a short distance up a hill.

A rock, which dries 6 feet (1m8), lies 2½ cables south-south-westward of the northern entrance point of Ngang Kong bay; it is steep-to, with depths of from 3¾ to 4 fathoms (6m9 to 7m3) around. A rock, awash, lies at the head of the bay, about 2 cables offshore, with depths of 2 fathoms (3m7) around.

The best landing is on the southern side of the head, where a small stream discharges into the bay.

Papai, an island, which lies about half a mile south-eastward of the north-eastern entrance point of Ngang Kong bay, is described on page 463.

From the north-eastern entrance point of Ngang Kong bay (*Lat. 22° 16′ N., Long. 114° 01′ E.*) the coast trends northward for about 2 miles to a promontory, 256 feet (78m0) high.

Tai pak, an island, 65 feet (19m8) high, lies about 4 cables south-eastward of this promontory and close westward of the north-western end of Ping chau (page 463). Close off the south-western and southern sides of Tai pak are two prominent rocks, 15 and 21 feet (4m6 and 6m4) high, respectively.

Comber rock, which dries 3 feet (0m9), lies nearly midway between Tai pak and the eastern side of Lantao. A rock, with a depth of 5 feet (1m5) over it, lies 7 cables southward of Comber rock and 1½ cables offshore.

Between the 256-foot (78m0) promontory and a point on the southern end of the peninsula forming the north-eastern end of Lantao, about

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Chart 1180.

1½ miles north-eastward, there are two bays, divided from one another by a projection. Two islets (chart 1466), the eastern of which is 40 feet (12m2) high, lie close together 3¾ cables southward of the projection separating the two bays. Midway between the western of these two islets and the south-western entrance point of the southern bay, there is a rock which dries 6 feet (1m8).

There is a depth of about 2 fathoms (3m7) in the southern bay, but otherwise it appears free from dangers and is available for small craft.

A bank, with depths of less than 3 fathoms (5m5) over it, extends southward from the two islets in the entrance of this bay as far as Papai.

Chart 1466.

The northern bay has a depth of 3½ fathoms (6m4) in the fairway of its entrance, and the depths gradually decrease towards its head.

WEST LAMMA CHANNEL. — Dangers. — Dumping and spoil grounds.—Buoys.—West Lamma channel is entered from southward between the south-eastern extremity of Cheung chau, and the south-western extremity of Pok liu chau, about 4¼ miles east-south-eastward.

The channel lies between the islands lying off the eastern side of Lantao, on its western side, and Pok liu chau and Hong Kong island, on its eastern side. From the eastern side of Lantao, a bank, with depths of less than 5 fathoms (9m1) over it, extends nearly across to the northern end of Pok liu chau, leaving a channel, about 2½ cables wide, between that island and the bank; in the fairway of this channel there is a depth of 5½ fathoms (10m1).

On the eastern side of West Lamma channel, Ha mei wan is entered between Ha mei tsui, a rounded, sloping point, situated about 3 cables northward of the south-western extremity of Pok liu chau, and Po lo tsui, about 2 miles north-north-westward.

Chart 3429.

Po lo tsui (*Lat. 22° 13′ N., Long. 114° 06′ E.*) is composed of high rocks with no off-lying dangers, and is the western extremity of Ching lum leng, a steep-sided promontory, 387 feet (118m0) high, which forms the northern side of Ha mei wan. This bay affords good anchorage for all vessels and is well sheltered from easterly winds.

Yung shu wan is entered between Po lo tsui and Shek kok tsui, the north-western extremity of Pok liu chau, 9 cables northward. This bay is divided into two portions by Otsi kok, a small projection, and may be used by small vessels. There are several villages and cultivated valleys in this locality.

Otsi pai, a rock which dries 5 feet (1m5), lies about three-quarters of a cable westward of Otsi kok.

Shek kok tsui rises steeply inland; a reef extends one cable north-westward from Shek kok tsui, with a rock, which dries 2 feet (0m6), at its extremity; within it is a rock which dries 7 feet (2m1). The south-western extremity of Pok liu chau (chart 1466), bearing 162°, and open south-westward of Po lo tsui, leads south-westward, and the summit of Chu kwu chau, bearing 086°, and open northward of the northern extremity of Pok liu chau, leads northward of this reef.

Between Shek kok tsui and Pak kok, the northern extremity of Pok

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Chart 3429.

liu chau, 8 cables east-north-eastward, the north-western side of that island is foul for a distance of from a half to one cable offshore. On Pak kok, which is fairly steep-to, there is a conspicuous boulder. Pa chau, a hill 447 feet (136m2) high, lies about 3 cables southward of Pak kok.

East Lamma channel joins West Lamma channel between Pak kok and Shektong tsui, the western extremity of Hong Kong island, 2 miles northward.

There is an obstruction about 1½ miles west-north-westward of Pak kok.

A conical buoy, painted in black and white bands, is moored about 1½ miles north-westward of Pak kok; its position is approximate.

A spoil ground, marked by a can buoy, painted yellow, is situated about 2½ miles north-westward of Pak kok.

Chart 1466.

On the western side of West Lamma channel the eastern side of Cheung chau is indented by Tung wan and another small bay, close northward. The cliff on the north-eastern extremity of Cheung chau is whitewashed. Cheung chau rock, which dries 5 feet (1m5), lies about 3 cables eastward of the eastern extremity of Cheung chau; a head, with a depth of 1¾ fathoms (3m2) over it, lies close south-westward of this rock.

Papai, about one mile north-north-eastward of Cheung chau, is 598 feet (182m3) high, near its centre, and at its southern end is a peak, 396 feet (120m7) high; westward of this peak, and 1¾ cables offshore, are three prominent pinnacle rocks, the highest of which has an elevation of 18 feet (5m5).

Chau kung, an island, 354 feet (107m9) high near its eastern end, lies north-eastward of Papai, separated by a channel 1¼ cables wide, both sides of which are fringed by rocks, which dry.

Datum rock, one foot (0m3) high, lies about 6 cables north-eastward of Chau kung.

Ping chau, about one mile north-north-westward of Chau kung, rises in its northern part to an elevation of 149 feet (45m4), and in its southern part to 321 feet (97m8); these two parts are connected by a low sandy neck forming a sandy bight, open north-eastward. On this neck, is a village with some limeworks at its northern end.

Tai pak, which lies close off the north-western extremity of Ping chau, is described on page 461.

Chart 3280.

Siu Kau, an island, 113 feet (34m4) high, with a cairn (*Lat. 22° 17′ N., Long. 114° 03′ E.*) on its summit, lies eastward of Ping chau, separated by a channel about 6 cables wide. The island is fringed by a reef; on its southern side, foul ground, on which are some rocks, above water, extends nearly half a cable offshore, and a bank, with depths of less than 3 fathoms (5m5) over it, extends a little over half a cable from its northern side. A detached shoal, over which there is a least depth of 16 feet (4m9), lies about one cable northward of the island.

Kau i chau, 370 feet (112m8) high, the outermost of the islands lying off the eastern side of Lantao, lies east-south-eastward of Siu Kau, separated by a channel about three-quarters of a mile wide. The island is fringed by rocks, some of which are above water, and by

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Chart 3280.

a bank, with depths of less than 3 fathoms (5m5) over it, extending about half a cable offshore in places.

Douglas rock, awash, is situated nearly in the middle of the northern part of the last-mentioned channel, on the western edge of a bank, over which there are depths of from 3½ to 5 fathoms (6m4 to 9m1). The southern end of this bank lies about three-quarters of a cable north-westward of Kau i chau; the extent of the bank can best be seen on the chart.

A dumping ground for heavy material from Naval salvage vessels, indicated by pecked lines on the chart, lies between Siu Kau and Kau i chau.

The northern part of West Lamma channel is reduced to a width of about 2 miles between Kau i chau and Shektong tsui (page 463).

Hong Kong harbour is entered from the north-eastern end of West Lamma channel through Sulphur channel, which is entered between the western end of Hong Kong island and Tsing chau or Green island, 299 feet (91m1) high, about a quarter of a mile north-westward. Sulphur channel is described on page 480.

Northward of the line joining Tsing chau and Kau i chau, West Lamma channel leads into an extensive area, at the north-western end of which Kap shui mun is entered between the south-eastern end of the peninsula forming the north-eastern end of Lantao (page 461), and the south-western extremity of Tsing island, about 2 miles east-north-eastward. Kap shui mun is described on page 581.

At the north-eastern end of this area, Rambler channel (page 583) is entered between the south-eastern extremity of Tsing island and a point on the mainland, about 1½ miles north-eastward.

On the eastern side of this area, Hong Kong harbour is entered from westward between Tsing chau and the western extremity of Ngon shun chau or Stonecutters island, about 2¼ miles north-north-eastward, and also between the latter and the eastern entrance point of Rambler channel, mentioned above. For the western end of Hong Kong harbour, *see* page 480.

Light.—Signal station.—A light is exhibited, at an elevation of 110 feet (33m5), from a white circular tower, 58 feet (17m7) in height, on the south-western side of Tsing chau (*Lat. 22° 17′ N., Long. 114° 07′ E.*).

There is a signal station on Tsing chau, connected by telephone with the Director of Marine's office at Hong Kong.

Local storm signals are displayed, during the day, at the signal station (*see* page 497).

Vessels desirous of entering or leaving the harbour by the western entrance, or requesting permission to anchor outside the western harbour limits, must first identify themselves to this signal station. *Chart 1466.*

Tidal streams.—In West Lamma channel the tidal stream sets northward from shortly after low water at Hong Kong until shortly after high water there and southward the rest of the time. The rate of the streams seldom exceeds 2 knots.

Directions.—West Lamma channel is free from dangers in and near its fairway. Cheung chau rock (page 463), and the reef which extends about one cable from the north-western extremity of Pok liu chau, should be given a wide berth. Vessels drawing more than 20 feet

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Chart 1466.

(6m1) should keep within half a mile of the salient points of Pok liu chau, where the depths are not less than 5¼ fathoms (9m6).

Directions for approaching West Lamma channel are given on page 479, and for entering Hong Kong harbour on page 491.

POK LIU CHAU.—Pok liu chau, or Lamma island, lies between West and East Lamma channels. The island consists of a succession of steep hills of barren appearance, and is nearly divided into two portions by a low, narrow isthmus near its centre. It is partially cultivated, but the population is scanty and consists chiefly of fishermen. Pok liu chau, 1,160 feet (353m6) high, the summit of the island, lies about three-quarters of a mile east-north-eastward of Ha mei tsui (page 462).

Southern side.—Between Ha mei tsui and Tai kok, about 1¼ miles east-south-eastward, the coast is high and rocky, with two small indentations.

Sam wan is entered between Tai kok, a high, rocky point, and Un kok, about three-quarters of a mile east-north-eastward. This bay is clear of shoals in the middle and there is a sandy beach at its head. The bay is not recommended as the swell is almost continuous and landing, even at its head, is bad.

Un kok is the termination of a rocky, hilly promontory; the point rises suddenly to Unchau, a small round hill, 178 feet (54m2) high, which is prominent on northerly or southerly bearings. The promontory rises to an elevation of 370 feet (112m8).

EAST LAMMA CHANNEL. — Beacons. — Dangers. — East Lamma channel lies between Pok liu chau and the south-western side of Hong Kong island, and is the shortest route to the western entrance of Hong Kong harbour from eastward. Its least width is 9 cables, between the northern end of Pok liu chau and Chu kwu chau or Magazine island, one of several which lie close off the south-western side of Hong Kong island. It is entered from southward between Un kok and Bluff point, the southern extremity of Hong Kong island, about 3½ miles east-north-eastward.

On the western side of the entrance there is a bay between Un kok (*Lat. 22° 11′ N., Long. 114° 09′ E.*) and Wong chu kok, the eastern extremity of Pok liu chau, about 1½ miles north-north-eastward.

Chart 3429.

At the head of this bay there is a shallow cove, fronted by rocks both above water and sunken. The bay is of no value as an anchorage, as a constant swell sets in and there is no landing except in the finest weather.

Chart 380.

Oliver shoals, consisting of coral, over which there is a least depth of 6 fathoms (11m0), lie on the eastern side of the southern approach to East Lamma channel, three-quarters of a mile southward of Bluff point.

Bluff point, with Taitam tau, a high bluff and fairly steep-to, about a quarter of a mile eastward, is situated at the southern end of Taitam peninsula which rises to an elevation of 577 feet (175m9) and extends from the southern side of Hong Kong island.

There are two beacons on Bluff point for use with the measured

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Chart 380.

distance (*see* page 469). The front beacon stands at an elevation of 257 feet (78m3) high, and the rear beacon, about one cable north-eastward, at 348 feet (106m1).

Chart 3429.

Chik chu wan, or Stanley bay, is entered between Bluff point and Chung hum kok, about 1¼ miles north-westward. This bay is available for anchorage during the North-east monsoon, but is not recommended during the South-west monsoon in consequence of the swell, which makes landing difficult; the chart is the best guide for anchoring in this bay. Foul ground extends one cable from the head of the bay. Chik chu, or Stanley, a village in which there is a prominent police station, and which is connected to the telephone system, is situated on a narrow neck which separates the head of Chik chu wan from Taitam wan (page 473).

Chung hum kok is the south-western extremity of a barren, rocky promontory rising to an elevation of 450 feet (137m2), on the summit of which is a remarkable boulder.

Ngan chau, an island, 232 feet (70m7) high, lies on the north-eastern side of East Lamma channel, about half a mile west-north-westward of Chung hum kok, and in the approach to Chung hom wan. Its coast is fringed with boulders. Ngan chau ma pai, a rock with a depth of 1¼ fathoms (2m3) over it, lies about 1¼ cables westward of the north-western extremity of Ngan chau. Ngan chau tan pai, which dries, lies close off the south-eastern extremity, and there are several scattered boulders in this locality. Tsui lan am pai, a rock with a depth of 2¼ fathoms (4m1) over it, lies close south-eastward of the southern extremity. The land on the northern side of the island is partially cultivated.

The coast of Ngan chau should be approached by large boats with caution.

There are two beacons close south-westward of the summit of Ngan chau; they are a short distance apart, in a north-easterly direction, and are for use with the measured distance described on page 469.

Chung hom wan, of no importance, is entered between Chung hum kok and a point about 9 cables northward. Close westward of the last mentioned point there is a group of steep, rocky islets; Makong (*Lat. 22° 14′ N., Long. 114° 11′ E.*), the highest of these, is 92 feet (28m0) high. Between the islets and the point, there is a safe, but narrow, boat passage, in the fairway of which there is a depth of 4 feet (1m2). Makong mi pai, with a depth of 3 fathoms (5m5) over it, lies close off the south-westernmost of the group.

Between Makong and Sam shui kok, the southern extremity of a peninsula with steep, cliffy coasts, about one mile west-north-westward, there are two bays, divided from one another by a thickly wooded projection, close off which is an island.

Tsin shui wan or Repulse bay, the south-eastern of the two bays, is clear of shoals, but there is generally a swell in the bay and landing is attended with inconvenience. There is a sandy beach on the eastern side of the northern part of this bay, near which is a prominent hotel.

Tung ku chau, 389 feet (118m6) high, lies close off the projection between the two bays, separated by a narrow passage, in the fairway of which there is a depth of 3 feet (0m9). The island is fringed by a narrow bank, over which there are depths of less than 2 fathoms (3m7).

Charts 1466, 3605, 1180, 3026, 1962, 2661a, 2661b, 1262, 1263.

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Chart 3429.

Tung ku pai, a rock with a depth of 1½ fathoms (2m7) over it, lies close south-westward of the southern extremity of Tung ku chau. A rock, which dries 7 feet (2m1), lies half a cable northward of the western extremity of the island and close offshore.

Sam shui wan, or Deep water bay, the north-western of the two bays mentioned above, is well sheltered by Tung ku chau, but is not available for shipping on account of telegraph cables which are landed at the beach at the north-eastern end of the bay, where there is a cable hut and a pavilion with a flagstaff. At the north-western end of the bay there is a pier, and, a short distance inland, a tile factory with some prominent chimneys and several houses.

Kopai, a rock with a depth of 4½ fathoms (8m2) over it, lies about three-quarters of a cable eastward of Wong chu kok (page 465); there are overfalls in the vicinity of this rock.

Between Wong chu kok and Pak kok, the north-eastern side of Pok liu chau is indented by two bays, divided from one another, about midway, by a projection, 409 feet (124m7) high and covered with long grass and bushes. The eastern side of this projection consists of cliff.

Luk chau, 215 feet (65m5) high, lies close northward of the projection, mentioned above, separated by a narrow passage, about three-quarters of a cable wide, available for boats with local knowledge. Both sides of this passage are rocky, and, on its southern side, close offshore, there is a rock which dries 3 feet (0m9).

Sokku wan or Picnic bay, the southern of these two bays, affords good anchorage for vessels of moderate size, in depths of from 6 to 7 fathoms (11m0 to 12m8), and its outer part is free from dangers. At a distance of 3 cables from its head, it narrows to a width of about 3 cables, with a bank, parts of which dry, extending about one cable from its south-eastern and western sides, with depths of less than 2 fathoms (3m7) over it, and a less distance from its north-western side; the head of the bay dries, and from here the hills rise steeply to the summit of the island.

Chau wan (*Lat. 22° 14′ N., Long. 114° 07′ E.*), the northern of these two bays, affords good anchorage, during the South-west monsoon, in almost any part, in depths of from 5 to 6 fathoms (9m1 to 11m0), good holding ground; depths of less than 5 fathoms (9m1) extend nearly 2 cables from the southern end of the bay.

On the north-eastern side of East Lamma channel, Aberdeen channel (page 469) is entered from southward between Sam shui kok, and the southern extremity of Aplipai, about half a mile westward. A rocky patch, with a depth of 1½ fathoms (2m7) over it, lies close off the south-western side of Sam shui kok and extends seaward for about 60 yards (54m9).

Aplipai, 212 feet (64m6) high and with a cliffy coast, is a tongue of land connected to the south-eastern end of Apli chau by a low narrow neck.

Assistance rock, with a depth of 1½ fathoms (2m7) over it, lies about three-quarters of a cable south-westward of the southern end of Aplipai. The south-western extremity of Hong Kong island in line with the eastern extremity of Chu kwu chau, bearing 315°, or the latter bearing more than 315°, leads south-westward of this rock.

Charts 3385, 3429.

Apli chau which rises to Mount Johnston, 632 feet (192m6) high, is

Charts 1466, 1180, 3026, 1962, 2661a, 2661b, 1262, 1263.

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Charts 3385, 3429.

separated from the south-western side of Hong Kong island by Aberdeen channel on its eastern side, and by Aberdeen harbour on its northern side. Apli chau consists of steep hills, barren of cultivation, but planted with trees on their northern slopes. On the south-western side of the island, between Fo yo kok, its western extremity, and a point about 3 cables south-eastward, there is a cove in which small craft can obtain sheltered anchorage; a conspicuous tree stands near the shore on the south-eastern side of the head of the cove. Lungshan pai or West reef, a group of rocks, 10 feet (3m0) high and marked by a beacon on the northern side, lies about 1¾ cables southward of Fo yo kok. There are deep passages between Lungshan pai and both Apli chau and Chu kwu chau, but as the tidal streams are strong, caution is necessary.

Chu kwu chau, or Magazine island, lies westward of Fo yo kok, separated by a channel 1½ cables wide; the island is 79 feet (24m1) high and fringed by a shallow bank which extends about a quarter of a cable offshore. A boat jetty is situated in the middle of the northern side of the island. Near the summit of the island there is a prominent building with an arched roof, and one or two small buildings adjoin it.

A beacon, for use with the measured distance described on page 469, stands on the southern side of Chu kwu chau, close westward of its eastern extremity.

Aberdeen harbour (page 469) is entered from westward between Fo yo kok (*Lat. 22° 15′ N., Long. 114° 08′ E.*) and a point on the south-western side of Hong Kong island, about half a mile north-westward. Pollux rock, which dries less than one foot (0m3), is the outermost of several scattered rocks which lie close south-westward of the north-western entrance point of Aberdeen harbour. The eastern extremity of Chu kwu chau in line with a point on the south-western side of Apli chau, situated about 3¼ cables south-eastward of Fo yo kok, bearing about 120°, leads south-westward of these rocks.

Between the north-western entrance point of Aberdeen harbour and a point about a quarter of a mile north-westward, there is a bight in the western side of Hong Kong island; Waterfall bay is situated at the northern end of this bight. The shore of the bight is fringed by a narrow drying bank, off which depths of less than 3 fathoms (5m5) extend about half a cable. Waterfall bay is of no importance.

Chart 3429.

Between the western entrance point of Waterfall bay and Shek-tong tsui (page 463), there are two bays on the western side of Hong Kong island, divided from one another, about midway, by a projection. Tai ho wan, the southern bay, should be avoided on account of the telegraph cables in it; the area in which they lie is indicated by pecked lines on the chart. Sandy bay, the northern of the two bays, is not recommended. This bay is divided into two portions by a small projection; a 3-fathom (5m5) patch lies in its entrance about 2 cables south-south-westward of this projection. The village of Hoi chi wan is situated at the head of the northern portion, where a bank, which dries, extends for about half a cable offshore.

Between Shek tong tsui and Pak kok, the northern extremity of Pok liu chau (page 465), East Lamma channel joins West Lamma channel.

Lamma patch, with a depth of 5¼ fathoms (9m6) over it, lies near

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Chart 3429.

the fairway of the north-western entrance of East Lamma channel, about 4½ cables north-north-eastward of Pak kok.

Prohibited anchorage.—Anchorage is prohibited within a distance of 2 cables on either side of a line joining the southern extremity of Wong chu kok (page 465) and Chung hum kok (page 466), on Hong Kong island, about 2 miles eastward.

Measured distance.—Beacons.—A distance of 5 miles is marked off in East Lamma channel, the running line being marked by a white painted patch on Po toi (page 471), in line with the summit of Lochau pak pai (chart 1466), bearing 123° 31′. The depths on the running line are from 12 to 22 fathoms (21^{m}9 to 40^{m}2).

The south-eastern portion, a distance of 12,160 feet (3,706^{m}4), lies between a pair of beacons in line on Bluff point (page 465), and a pair on Ngan chau; the north-western portion, 18,240 feet (5,559^{m}6), lies between the alignment of the latter beacons and the alignment of one near the eastern extremity of Chu kwu chau and another on the northern side of the entrance to Aberdeen harbour.

Storm signals.—When local storm signals are displayed at Hong Kong, supplementary signals are displayed at Chik chu police station, at the head of Chik chu wan. *See* page 498.

Charts 3385, 3429.

Aberdeen channel.—Dangers.—Aberdeen channel is the south-eastern portion of the passage between Apli chau and Hong Kong island; its southern entrance is described on page 467. Deep pass, between Deep Pass point (*Lat. 22° 15′ N., Long. 114° 09′ E.*) and the north-eastern extremity of Apli chau, about one cable south-westward, is situated at the northern end of Aberdeen channel and connects it with Aberdeen harbour.

The shores of Aberdeen channel are foul and it is not recommended for vessels. About 2¼ cables south-eastward of Deep Pass point, the channel is much contracted by the shoals extending from both sides, with a 2¾-fathom (5^{m}0) patch in the fairway between. On the eastern shore there are several small bays and many scattered rocks; the northernmost of these small bays might be useful as a temporary anchorage for a small vessel with local knowledge, but great caution is necessary in using any of the indentations in the shores of the channel.

Chart 3385.

Aberdeen harbour.—Beacon.—The western entrance of Aberdeen harbour, a safe and well-sheltered harbour between the northern side of Apli chau and Hong Kong island, is described on page 468. The harbour is so narrow that vessels over 200 feet (61^{m}0) long cannot lie at anchor without blocking the fairway. On account of the dry docks situated at Aberdeen it is frequently visited by vessels of considerable size, but they go directly into dock; the harbour is also used by numerous fishing craft.

About one cable northward of the north-western entrance point there is a Chinese cemetery, with a hut situated in a clump of bamboos near by; Kellet bay lies close eastward of the point. The shores of this bay are fringed by a bank, with depths of less than 18 feet (5^{m}5) over it, extending about half a cable from its head; on the north-western side of the head of the bay the land rises fairly steeply to a peak, 312 feet (95^{m}1) high.

A beacon, for use with the measured distance (*see* above), stands

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Chart 3385.

about 2 cables eastward of the eastern entrance point of Kellet bay and about 4½ cables north-eastward of the beacon on Chu kwu chau, previously mentioned. Some wreckage is indicated on the chart on the edge of the 3-fathom (5m5) line, about three-quarters of a cable southward of the northern of these beacons. Stone steps, leading to the coastal road on the northern side of the harbour, are situated about 2¾ cables east-south-eastward of this beacon ; a patch, which dries, lies westward of the steps, and a bank, with depths of less than 6 feet (1m8) over it, extends about half a cable from the shore of a small bight westward of the steps.

Aberdeen docks are situated about a quarter of a mile eastward of the stone steps. A high chimney, with the dock manager's house a quarter of a cable south-westward, stands close westward of the docks. Some wharfage for small craft, with a mooring buoy off its western end, is situated westward of the entrances to the dry docks ; there is a small slip near the western end of this wharfage and, close eastward of the slip, there is a wooden pier.

There is a depth of 10 feet (3m0) close south-westward of the pier, and there are patches with depths of 23 and 21 feet (7m0 and 6m4) over them, in the harbour about three-quarters of a cable south-eastward and 1½ cables south-south-eastward, respectively, of the pier head.

Two dry docks, Hope dock and, close eastward of it, Lamont dock, are situated at the eastern end of the above wharfage. Hope dock is 428 feet (130m5) in length ; in 1948, Lamont dock, about 310 feet (94m5) long, was being used as a wet dock.

A pier, for the use of ferries plying to Hong Kong, is situated eastward of the dry docks ; Aberdeen village, in which there is a police station (*Lat. 22° 15′ N., Long. 114° 09′ E.*), stands close eastward. Staunton creek, which dries about 2 feet (0m6) in its centre, forms the north-eastern end of the harbour ; it is entered between the Government wooden pier, situated 1¾ cables eastward of the ferry pier, and Deep Pass point. Aberdeen Industrial school and the fish market, with a quay, lie close eastward of the Government pier. On Deep Pass point is the Roman Catholic college which is conspicuous. Staunton creek is dominated on its northern side by Bennet's hill, a 791-foot (241m1) peak (chart 3429), close westward of which there is a conspicuous boulder lying at an elevation of 680 feet (207m3).

The southern side of Aberdeen harbour, westward of Deep pass, is formed by the wooded northern shores of Apli chau. A conspicuous Joss house stands near a 185-foot (56m4) summit on the north-western part of this island ; the village of Aplichau stands partly on reclaimed ground near the head of a bight on the north-eastern part of the island. Eastward of the village there is a small promontory, 32 feet (9m8) high, the eastern extremity of which is marked by a beacon ; the promontory forms the northern entrance point of a drying mud creek, the southern side of the entrance to which is marked by a stake, situated within the 3-fathom (5m5) line, about half a cable eastward of the beacon.

A bank, with depths of less than 18 feet (5m5) over it, extends about a quarter of a cable from the northern side of Apli chau, except off its north-eastern extremity where the coast is fringed by a reef, which dries from 2 to 3 feet (0m6 to 0m9), and which extends more than a quarter of a cable into Deep pass.

Tidal streams.—The streams set eastward and westward through

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Chart 3385.

Deep pass, and attain a rate of from 2 to 3 knots at springs; the east-going stream in the pass commences at about high water at Hong Kong and the west-going at about low water in the pass. In the western part of the harbour there is very little tidal stream. The flood stream sets westward across the channel between Chu kwu chau and Apli chau.

Storm signals.—When local storm signals are displayed in Hong Kong harbour, supplementary signals are displayed at the police station at Aberdeen (*see* page 498).

Anchorages.—A short vessel can anchor on the northern side of Aberdeen harbour, in a depth of 5 fathoms (9^{m}1), with Fo yo kok, bearing 213°, the dockyard manager's house, bearing 084°, and the hut in the clump of bamboos near the Chinese cemetery on the north-western side of the entrance, bearing 287°. This clump of bamboos is useful when anchoring at night.

A long vessel can anchor near the middle of the western part of the harbour, with Fo yo kok, bearing 160°, distant 1½ cables, in a depth of about 5 fathoms (9^{m}1).

Charts 3385, 3429.

Directions.—A vessel entering from westward should keep in mid-channel. If using the passage between Chu kwu chau and Apli chau, when the west-going stream is running, she should take care to avoid being set on to the eastern end of Chu kwu chau.

The eastern approach, through Aberdeen channel and Deep pass, is not recommended; the navigable channel in Deep pass is only about half a cable wide, and the course through is not straight, which makes the pass difficult except at slack water. It is generally crowded with fishing craft.

The following directions are given should it be necessary to make use of Deep pass:—

Proceeding up Aberdeen channel, as Deep pass is approached, edge over eastward until the south-western extremity of the land south-westward of Aberdeen village police station is in line with the high chimney of the dockyard, bearing 300°; then keep on this alignment, edging gradually northward as Deep Pass point (*Lat. 22° 15′ N., Long. 114° 10′ E.*) is neared. When the extremity of the land south-westward of the police station bears 296°, pass through the narrows with it on that bearing. When the beacon marking the extremity of the small 32-foot (9^{m}8) promontory on the north-eastern side of Apli chau is abeam, course should be altered towards the middle of the harbour, with Deep Pass point bearing 097°, astern, and thence as requisite.

Vessels using Deep pass should proceed as slow as possible to prevent damage being done to native craft by the wash.

Chart 3605.

LEMA CHANNEL.—Lema channel lies between Tankan shan (page 457) and the Po toi group of islands, about 6 miles north-north-westward; it is deep and clear of dangers.

Po toi group.—Dangers.—The Po toi group of islands is separated from the south-eastern side of Hong Kong island by Shing shi mun (page 473), about one mile wide.

Po toi, the southernmost and largest of this group, 776 feet (236^{m}5)

Charts 1466, 1180, 3026, 1962, 2661a, 2661b, 1262, 1263.

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Chart 3605.

high, and inhabited, lies about 2½ miles south-eastward of Bluff point (page 465). Po toi is of barren appearance, there being only a small quantity of brushwood in the valleys. On its south-western side there is a boat cove and a rocky islet, 117 feet (35m7) high, is situated close offshore about 4 cables north-westward of Namkok tsui, the southern extremity of the island. There are rocks near the coasts of the island in places.

There is a white painted patch on the north-western side of Po toi for use with the measured distance, in East Lamma channel (page 469).

Chart 380.

Lo chau, the north-westernmost of the Po toi group, lies north-westward of Po toi, separated by a channel about 3½ cables wide. Lo chau is 878 feet (271m6) high, flattened at the summit and with steep slopes; its north-western brow has a small peak, with a few large and remarkable boulders on it. The island is uninhabited. Lochau pak pai, or Castle rock, 50 feet (15m2) high, with a rock, which dries 2 feet (0m6), half a cable westward of its northern extremity, lies 4½ cables south-westward of Lo chau. Two obelisks at the head of Taitam wan (page 473), in line, bearing 358°, lead about 3 cables westward of Lo chau pak pai.

Chart 1466.

Sam kong, an island, 481 feet (146m6) high, covered with grass and small bushes, and which is uninhabited, lies about three-quarters of a mile north-eastward of Po toi. An islet, 90 feet (27m4) high, lies close off the north-eastern end of Sam kong.

Fury rocks, 15 feet (4m6) high, with rocky and uneven ground close around, lie 2¾ cables north-westward of Sam kong, with depths of 8 fathoms (14m6) in the fairway between.

Wang lan, a barren, rocky islet, about 100 feet (30m5) high at its northern end, and divided into two parts by a narrow boat passage, lies about three-quarters of a mile eastward of Sam kong. There is a landing place on the north-western side of the southern part of Wang lan. A rock (*Lat. 22° 11′ N., Long. 114° 18′ E.*), 3 feet (0m9) high, lies close off the south-western side of the southern part of the island; Likin rock, with a depth of 3 fathoms (5m5) over it, lies about 1½ cables farther westward. Branch shoal, with a depth of 6 fathoms (11m0) over rock, lies about 1½ cables south-westward of the south-western extremity of Wang lan.

Chart 3605.

Tidal streams.—In Lema channel, during south-westerly winds, there is generally an easterly set, the streams out of the various channels setting eastward while the tide is falling, and north-eastward while it is rising; with strong south-westerly winds, the rate of the stream is about 1½ knots.

Chart 1466.

Light.—Fog signal.—Storm signals.—Radiobeacon.—A light is exhibited, at an elevation of 225 feet (68m6), from a circular iron tower, 52 feet (15m8) in height, the upper half red, the lower, white, on the summit of the southern part of Wang lan. A fog signal is sounded from the lighthouse.

A radiobeacon is situated at the lighthouse.

Vessels can communicate by means of the International Code of Signals with Wang lan lighthouse, which is connected by telephone

Charts 1180, 3026, 1962, 2661a, 2661b, 1262, 1263.

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Chart 1466.

with the Harbour Master's office at Hong Kong. The submarine cable connecting Wang lan with Hong Kong island is indicated on the chart.

When local storm signals are displayed at Hong Kong, supplementary signals are displayed at Wang lan. *See* page 498.

See extract from Hong Kong Merchant Shipping ordinance of 1899, on page 456.

Chart 380.

SOUTHERN SIDE OF HONG KONG ISLAND.—Shing shi mun.—The southern side of Hong Kong island, westward of Bluff point, has already been described on pages 466-471.

Shing shi mun is entered from westward between Lochau pak pai and the southern end of the Taitam peninsula (page 465), about 1½ miles north-westward.

Oliver shoals (page 465) lie near the middle of the approach to the western entrance.

Taitam wan.—Beacons.—Taitam wan is entered between the south-eastern extremity of Taitam peninsula and the south-western extremity of another peninsula extending from the south-eastern side of Hong Kong island, about 1½ miles north-eastward.

Taitam wan is clear of danger and the depths decrease gradually towards its head.

Tweed islet, 70 feet (21m3) high, lies on the western side of Taitam wan, about half a mile northward of the western entrance point and near the end of a shallow spit which extends about a quarter of a mile offshore.

Taitam village stands at the head of a bight on the western side of the bay, about 8½ cables north-north-westward of Tweed islet. The village of Chik chu (page 466) is situated close southward of Taitam.

Two obelisks, each 30 feet (9m1) in height, and about one mile apart, stand near the head of Taitam wan, and in line, bear 358°.

Anchorage.—Directions.—Anchorage and shelter in bad weather, during the North-east monsoon, can be obtained in Taitam wan, as described below, but the bay is not recommended during the South-west monsoon because the swell makes landing difficult.

Anchorage can be obtained off Taitam village (*Lat. 22° 13′ N., Long. 114° 13′ E.*), in a depth of 6 fathoms (11m0); this position is well sheltered from all except southerly winds, and the islands and rocks near the entrance prevent much swell entering from that direction.

Vessels entering Taitam wan from eastward should pass through Shing shi mun. Vessels entering from southward should steer with the obelisks at the head of the bay in line, bearing 358°, and pass between Lochau pak pai, on the eastern side, and Oliver shoals, on the western side; thence towards the desired anchorage.

In the upper part of Taitam wan, caution is necessary to avoid numerous fishing stakes.

Tidal streams.—There is little tidal stream in Taitam wan or in Shing shi mun. The drift currents set up by the wind usually mask it.

Chart 3605.

APPROACHES TO TATHONG CHANNEL.—The Po toi

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Chart 3605.

group (page 471) lies in the southern approach and the Ninepin group in the north-eastern approach.

Ninepin group.—Dangers.—The Ninepin group of islands is situated about 4½ miles north-north-eastward of Wang lan (page 472), and 2 miles from the mainland.

North and South Ninepin, the two largest islands, are separated by a channel 2 cables wide. The southern coast of South Ninepin is a precipitous cliff, 359 feet (109m4) high; the northern part of the island is lower; close to its south-western side there is an islet, 178 feet (54m2) high, and close off its north-eastern side there are several rocks above water. A rock, which dries 6 feet (1m8), lies about one cable northward of the northern extremity of South Ninepin.

North Ninepin is 337 feet (102m7) high, and has a cleft near its northern end. A rock, above water, lies close off the south-western end of North Ninepin and two islets, close together, lie close off the northern end of the same island. The southern of these islets is 280 feet (85m3) high; a rock, which dries 7 feet (2m1), lies close northward of the northern islet.

North rock, about 12 feet (3m7) high, lies about half a mile north-eastward of North Ninepin; a rock, with a depth of 4¼ fathoms (7m8) over it, lies nearly one cable northward of it, with a spit, over which there is a depth of 8 fathoms (14m6), extending 1½ cables farther north-westward. A rock, which dries 6 feet (1m8), lies close eastward of North rock.

East Ninepin, shaped like a sugar-loaf when seen from north-westward or south-eastward, is 208 feet (63m4) high; an islet, 93 feet (28m3) high, lies one cable off its north-western end, and a rock, 19 feet (5m8) high, lies the same distance from its south-western side.

One-foot rock, with a depth of one foot (0m3) over it, lies 6½ cables southward of East Ninepin. Fat tau point (page 476), in line with the southern extremity of South Ninepin, bearing 278°, leads southward of One-foot rock.

The portion of the mainland, with its off-lying islands, lying north-westward of the Ninepin group, is described on pages 500-502.

Outlying danger.—Victor rock (*Lat. 22° 18′ N., Long. 114° 26′ E.*), with a depth of 3 fathoms (5m5) over it, and depths of from 5½ to 6 fathoms (10m1 to 11m0) close around, lies in the north-eastern approach to Tathong channel, about 4 miles north-eastward of East Ninepin. The summit of Lamtung in line with the north-western extremity of the islets lying close northward of North Ninepin, bearing 245°, leads half a mile north-westward; and the summit of South Ninepin, bearing 242°, and open south-eastward of the south-eastern extremity of East Ninepin, leads about a quarter of a mile south-eastward of Victor rock.

Caution.—The depths in the vicinity of the Ninepin group give no indication of approach to them, and caution must be exercised in thick weather.

Charts 380, 1466.

TATHONG CHANNEL. — Dangers. — Radio station. — Lights.—Fog signal.—Tathong channel is entered from south-eastward between Tai long head or Cape D'Aguilar, the south-eastern extremity of the peninsula which forms the eastern side of Taitam

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Charts 380, 1466.

wan, and Tathong point, the southern extremity of Lamtung (Lamtong) or Tung lung, an island about 2¼ miles north-eastward.

There is a prominent disused light-tower on Tai long head.

There is a light for the use of aircraft, which is visible from seaward, about one cable north-westward of the extremity of Tai long head. In 1949, it was reported that it is the first light sighted when approaching Hong Kong.

There is a radio station at Tai long head. *See* page 28.

Kau pi chau, two green islets, close together, the highest of which is 140 feet (42m7) high, lie close southward of Tai long head.

A telephone cable from Wang lan, indicated by a pecked line on chart 1466, is landed north-westward of Kau pi chau.

Chart 1466.

Bokhara rocks are two sunken rocks which lie on a bank of sand and rock, with depths of less than 10 fathoms (18m3) over it, situated on the south-western side of Tathong channel, about 6 cables north-eastward of Tai long head. The south-western rock, with a depth of 2½ fathoms (4m6) over it, is near the southern end of the bank, and the north-eastern rock, with a depth of 3½ fathoms (6m4) over it, lies near the north-eastern end. Taitam tau, bearing 258° and open southward of Kau pi chau, leads well southward; the western extremity of Futau chau, in line with Talong pai, bearing 358°, leads westward; the summit of Lo chau, in line with the eastern extremity of Kau pi chau, bearing 202°, leads north-westward; and Pottinger peak in line with Talong pai, bearing 319°, leads north-eastward of Bokhara rocks.

Bokhara rocks are covered by the *red* sector of Hak kok tau light when bearing more than 337°.

On the western side of Tathong channel, between Tai long head and a point, about 1¼ miles northward, there is a bight. Lap Sap wan is situated at the southern end of the bight, and Lu tiang wan, which is shallow and has a sandy beach at its head, is situated at the northern end.

Ng fan chau (*Lat. 22° 14′ N., Long. 114° 15′ E.*), a flat-topped, steep and cliffy islet, 145 feet (44m2) high, lies in the entrance of Lu tiang wan, about one cable southward of the northern entrance point. Two patches, with depths of 3¼ and 3¾ fathoms (5m9 and 6m9) over them, respectively, lie nearly midway between this island and the coast south-westward.

Taito chau, 174 feet (53m0) high, steep, cliffy and covered with low scrub, lies 1½ cables northward of Ng fan chau and close off the coast of Hong Kong island, to which it is connected by foul ground.

The coast between Taito chau and Hak kok tau, or Cape Collinson, 1¾ miles northward, is rocky, and landing is difficult except in a few places in the coves. Pottinger peak, 1,020 feet (310m9) high, lies 7 cables south-westward of Hak kok tau.

A light is exhibited, at an elevation of 163 feet (49m7), from a white tower on a dwelling, on Hak kok tau.

Talong pai, or Tathong rock, a flat rock, 6 feet (1m8) high, lies in the fairway of Tathong channel, about 4 cables east-north-eastward of Taito chau. There is a depth of 2½ fathoms (4m6), close northward, and a depth of 3¾ fathoms (6m9), close southward, of Talong pai. This rock is covered by the *red* sector of Hak kok tau light, bearing more than 337°.

Charts 3605, 1180, 3026, 1962, 2661a, 2661b, 1262, 1263.

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Chart 1466.

Shek O is a rocky and open bight immediately northward of Taito chau. It affords no protection for anchoring, and a heavy swell usually sets into it during the North-east monsoon. The head of the bay is foul.

Tai long wan, a small shallow bay, the head of which dries, is situated midway between Taito chau and Hak kok tau.

On the north-eastern side of Tathong channel is Tathong point, the southern extremity of a rocky peninsula, 203 feet (61m9) high, with steep, black cliffs, which extends from the southern side of Lamtung, and to which it is connected by a low, narrow neck. A white mark has been painted on the southern extremity of Lamtung; the summit of Lamtung, 818 feet (249m3) high, lies on the eastern side of the island, about 6½ cables north-north-eastward.

Ngai ying pai, a flat rock, 31 feet (9m4) high, lies about 1¾ cables southward of the western extremity of Lamtung, with reefs between it and the coast, one cable north-eastward.

A light is exhibited, at an elevation of 53 feet (16m2), from a white concrete beacon, 25 feet (7m6) in height, about one cable north-westward of Tathong point.

A fog signal is sounded at the light-beacon.

Chart 1466, plan of Fat tau mun.

Fat tau mun separates Lamtung from the southern end of a projection on the mainland north-eastward; Fat tau point lies at the south-eastern extremity of the projection. The passage is about 1¼ cables wide between the rocks which fringe the coasts and there is a narrow channel, in the fairway of which there is a depth of 3¼ fathoms (5m9), between the shoals which extend offshore from both sides. There is a one-fathom (1m8) rocky patch at the northern extremity of the rocks which fringe the southern shore of the passage. The channel is only suitable for small vessels with local knowledge.

On the southern side of the eastern approach to Fat tau mun, a rock, awash, lies about 3½ cables south-eastward of the northern extremity of Lamtung (*Lat. 22° 16′ N., Long. 114° 18′ E.*) and 2 cables offshore; the sea breaks on this rock during the North-east monsoon.

Chart 1466.

Tai miu, or Joss house bay, is entered between the south-western end of the projection which forms the northern side of Fat tau mun and a point about one mile west-north-westward. The coastal bank, with depths of less than 3 fathoms (5m5) over it, extends over 2 cables offshore in the north-eastern part of the bay, but in its western part the depths decrease gradually towards the northern shore. There is good anchorage in Tai miu, with the south-eastern extremity of Tit cham chau bearing 238°, and the northern extremity of Lamtung bearing 121°, in a depth of 5½ fathoms (10m1), mud. For the prohibited anchorage in the south-western approach to this bay, *see* page 477.

There is a concrete jetty, 90 feet (27m4) long, with a depth of 2 feet (0m6) at its head, extending from the shore southward of the Joss house.

Chart 3279.

Kun tsoi kok, an islet, 28 feet (8m5) high, lies close off the western entrance point of Tai miu, connected to it by a narrow drying bank; Tit cham chau, 95 feet (29m0) high, lies about 1½ cables south-westward of the same point, connected to it by a shallow ridge. Sunken rocks,

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Chart 3279.

with a rock above water at their extremity, extend about half a cable south-westward from the western end of Tit cham chau.

Futau chau, or Junk island, about three-quarters of a mile north-north-westward of Tit cham chau, is 320 feet (97m5) high, grassy, with here and there a few low trees. The island is connected with the mainland, on its eastern side, by a shallow, rocky ridge. Two islets lie close together off the southern extremity of Futau chau; a rock, which dries 3 feet (0m9), lies close southward of the southern islet.

Cheung kwan o (page 478) is entered between Futau chau and Lei u mun point, about 1¼ miles west-north-westward.

On the south-western side of Tathong channel, the coastal bank, with depths of 2 fathoms (3m7) over it, extends a quarter of a cable from Hak kok tau. Between Kai pei ha, about 3½ cables north-westward of Hak kok tau, and Lo shu pai, 8½ cables farther north-westward, there are two bights. A reef, with a depth of less than 6 feet (1m8) over it, lies, near the edge of the coastal bank, in the approach to Ma tong, the south-eastern bight, about 1½ cables north-westward of Kai pei ha. Ma tong is shallow, and dries at its head. A rocky ledge extends about one cable from the western entrance point of Ma tong, and a 15-foot (4m6) patch lies nearly one cable farther northward. Ngai ying pai (chart 1466), bearing more than 136°, and well open north-eastward of Hak kok tau, leads north-eastward of these dangers; they are covered by a *red* sector of Hak kok tau light when bearing less than 157°.

The bottom of Sai wan, the north-western of the above-mentioned bights, consists of mud, and the depths decrease gradually towards its head, which dries. An islet, 3 feet (0m9) high, with a rock, having a depth of less than 6 feet (1m8) over it, close south-eastward, lies a short distance eastward of Lo shu pai.

Between Lo shu pai and Pak sha wan, about 3 cables north-north-westward, there is a bight.

Light-buoy.—A can light-buoy, painted in black and white vertical stripes, fitted with a radar reflector, and exhibiting a *white flashing* light *every six seconds*, is moored 6 cables northward of Hak kok tau lighthouse (*Lat. 22° 16′ N., Long. 114° 16′ E.*). This light buoy, which is known as the Turning buoy, must be left on the port hand by all vessels using the eastern entrance.

Charts 3279, 1466.

Anchorage.—Prohibited anchorage.—There is good anchorage in Tathong channel except within an area southward of a line joining the south-eastern entrance point of Sai wan with the southern islet lying close off the south-western extremity of Futau chau, and which is indicated by pecked lines on the chart, where the anchorage is foul.

Anchorage is prohibited in an area, indicated by pecked lines on the chart, between the north-western side of Lamtung and Tit cham chau.

Lei u mun. — Lights. — Submarine cable. — Lei u mun is entered at the north-western end of Tathong channel, between Pak sha wan and Lei u mun point. The north-western end of Lei u mun forms the eastern entrance of Hong Kong harbour, between Kung Am, situated on the north-eastern side of Hong Kong island, 3½ cables

Charts 3605, 1180, 3026, 1962, 2661a, 2661b, 1262, 1263.

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Charts 3279, 1466.

north-westward of Pak sha wan, and Siu chau wan, the south-western extremity of a peninsula on the mainland, 2¼ cables north-eastward. The channel is deep, and the shores on either side are nearly steep-to beyond a distance of a quarter of a cable offshore.

A submarine cable, indicated on the chart, is laid across the north-western end of Lei u mun.

A light is exhibited, at an elevation of 11 feet (3m4), from a black and white chequered pillar, 11 feet (3m4) in height, on Kung Am.

A light is exhibited, at an elevation of 24 feet (7m3), from a red and white chequered pillar, 24 feet (7m3) in height, on Siu chau wan.

Devil's peak, 721 feet (219m8) high, lies about half a mile northward of Lei u mun point.

Storm signals.—Local storm signals are exhibited at night, at the barracks at Lei u mun. *See* page 497.

Cheung kwan o.—The entrance of Cheung kwan o, or Junk bay, is described on page 477.

Shek miu, a small bight, lies in the south-eastern part of the bay, eastward of Futau chau. In the western approach to Shek miu, the northern side of Futau chau is fringed by a bank which extends about half a cable offshore in places; some sunken rocks lie on this bank, about 2 cables eastward of the north-western extremity of Futau chau, and a rock, which dries about 6 feet (1m8), lies about half a cable north-eastward of the north-eastern extremity of the same island. A rock, which dries about 6 feet (1m8), lies about 2 cables farther east-north-eastward, and half a cable off a small projection at the head of Shek miu.

Pak shek kok lies on the eastern side of Cheung kwan o, about one mile northward of the north-western extremity of Futau chau, and Mun chau lies on the western side of the bay, about one mile westward of Pak shek kok.

The northern end of Cheung kwan o is divided into two bays by a projection; A Kung wan, a large village, at the southern end of which is a jetty, is situated on the north-eastern shore of Ap chai wan, the eastern of these two bays.

Anchorages.—There is anchorage for small vessels with local knowledge near the centre of Shek miu, in a depth of 4 fathoms (7m3). Larger vessels can anchor northward of Futau chau (*Lat. 22° 17′ N., Long. 114° 16′ E.*), in depths of from 4¾ to 5 fathoms (8m7 to 9m1), mud, where good protection is reported to be afforded in a typhoon. There is an examination anchorage in Cheung kwan o, which is indicated by pecked lines on chart 1466.

Tidal streams.—In Tathong channel the tidal stream sets in a north-westerly direction during the rising, and in a south-easterly direction during the falling tide, the streams turning at about the times of high and low water at Hong Kong. The greatest rate of these streams is one knot.

In Fat tau mun, the tidal stream sets north-westward during the rising, and south-eastward during the falling tide, with a rate of 3 knots at springs, but its force is only felt in the pass itself, and between Lamtong and Tit cham chau the stream is weak.

In Cheung kwan o the tidal streams are very weak and irregular.

The tidal streams set north-westward and south-eastward through Lei u mun, at the rate of from 2 to 3 knots at springs.

Charts 3605, 1180, 3026, 1962, 2661a, 2661b, 1262, 1263.

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Chart 1180.

GENERAL DIRECTIONS.—Wenwei chou lighthouse makes a good landfall for vessels approaching Hong Kong harbour from southward or south-eastward, and they can pass on either side of Chiapeng chuntao and Lima chuntao; at night, vessels should pass southward and eastward of these islands.

From a position 2 miles westward of Wenwei chou, a usual track for vessels of moderate draught, bound for the western entrance, is to pass 1½ miles south-eastward of Heng kaug chou, of the Sanmen group, and thence about 2 miles eastward of Wailingting; they then steer northward into West Lamma channel and should follow the directions given for that channel on page 464.

If passing southward and eastward of Chiapeng chuntao and Lima chuntao, when Wang lan lighthouse bears less than 338°, vessels bound for the western entrance can round the north-eastern end of Tankan shan and pass through Lema channel, and vessels bound for the eastern entrance can haul up to pass through Tathong channel.

Approaching from eastward, Wang lan lighthouse between the bearings of 236° and 338°, will lead in from seaward until Tathong point or Hak kok tau light-structures are seen; vessels bound for the western entrance can then pass through Lema channel and shape course either to pass through East Lamma channel, the shorter route, or through West Lamma channel.

Chart 1466.

Vessels drawing more than 24 feet (7m3) should use the eastern entrance to Hong Kong harbour, through Tathong channel, leaving the Turning buoy on the port hand (*see* page 477).

Tathong channel and Lei u mun are deep and clear of danger, excepting Bokhara rocks and Talong pai which may be passed on either side, but the main and wider route is eastward of them. Clearing marks for Bokhara rocks are given on page 475. At night, if a vessel keeps in the *white* sector of Hak kok tau light, between the bearings of 318° and 337°, she will pass eastward of Bokhara rocks and Talong pai (*Lat. 22° 14′ N., Long. 114° 16′ E.*).

If entering Tathong channel in misty weather, which is not recommended, a vessel should pass about 3 cables southward and westward of Tathong point and steer 293° until the western extremity of Lamtung is abeam, when she should alter course to 338°; if it is not desirable to proceed into Hong Kong harbour, she should haul over towards either shore, out of the fairway, and anchor as convenient, in a depth of 9 or 10 fathoms (16m5 or 18m3), but the depths in this vicinity are very even, and the soundings, except within the lines joining the projecting points, do not decrease, so caution is necessary in approaching the shore.

Directions for Hong Kong harbour are given on page 491.

HONG KONG ISLAND.—Hong Kong island is somewhat picturesque, but, on the whole, somewhat barren and unprepossessing. It consists generally of rocky ranges, the summit of which, Victoria peak, 1,809 feet (551m4) high, is situated near the north-western end of the island. The city of Victoria (page 491), extends about 5 miles along the western part of the northern side of the island.

The island is indented by numerous bays, the most considerable of which are on its southern side, and have already been described.

Charts 3605, 3026, 1962, 2661a, 2661b, 1262, 1263.

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Chart 1466.

There is good anchorage throughout the channel between the island and the mainland, except in Lei u mun, which is deep, but the best is in Hong Kong harbour.

Charts 1459, 3279, 3280.

HONG KONG HARBOUR.—Limits.—Depths.—Hong Kong harbour, as defined by the port authorities, lies between the northern side of Hong Kong island and the mainland, and extends between the following limits, which are indicated on the chart by pecked lines :—

West limit.—A straight line drawn from the westernmost point of Hong Kong island (*Lat. 22° 17′ N., Long. 114° 07′ E.*) to the westernmost point of Tsing chau, thence to the westernmost point of Ngon shun chau, thence in an 000° direction to the mainland.

East limit.—A straight line drawn from the westernmost extremity of Kung Am to the westernmost extremity of Siu chau wan.

Hong Kong is occasionally referred to as the Port of Victoria.

A bar, over which vessels can carry a least depth of 4 fathoms (7m3) at lowest low water, stretches across the western entrance of Hong Kong harbour; eastward of this bar the depths increase to 6 and 8 fathoms (11m0 and 14m6) within the harbour.

The approach by steamers, through this entrance, is usually by Sulphur channel. Vessels can, however, approach through the examination anchorage, northward of Kellet bank, described below, and small craft can cross this bank, but in any case the above-mentioned bar has to be crossed to enter the harbour.

Chart 3280.

Sulphur channel.—Submarine cable.—The entrance to Sulphur channel is described on page 464. The channel is about 2 cables wide in its narrowest part and is free from dangers. On its north-western side, the coast of Tsing chau is fringed by a narrow bank on which are some rocks above water; there is a landing place on the south-eastern side of that island. Little Green island, 83 feet (25m3) high, lies about half a cable eastward of Tsing chau.

The south-eastern side of the channel is formed by the north-western end of Hong Kong island.

A submarine cable, indicated on the chart, is laid across Sulphur channel in a south-easterly direction from the south-eastern extremity of Tsing chau (*Lat. 22° 17′ N., Long. 114° 07′ E.*).

Western end of harbour. — Dangers. — Buoys. — Obstructions.—Caution.—The western end of the City of Victoria is situated on the northern side of Hong Kong island, about 8 cables eastward of Tsing chau lighthouse. Belcher bay lies between the western end of the city and Belcher point, about half a mile east-north-eastward. A rock, with a depth of less than 6 feet (1m8) over it, with a 16-foot (4m9) patch close north-eastward of it, lies about half a cable westward of Belcher point.

Off that portion of the coast described above, a bank, over which there are depths of less than 5 fathoms (9m1), extends across to the mainland; the extent of this bank can best be seen on the chart. Kellett bank, the western portion of this bank, extends about 2 miles north-north-westward of Tsing chau, leaving a channel, about half a mile wide, between its north-western end and Tsing island rock,

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Chart 3280.

55 feet (16m8) high, which lies close off the south-eastern end of Tsing island (page 583). Kellett bank protects Hong Kong harbour from westward; several patches, with a least depth of 3 fathoms (5m5) over them, lie on the bank from 2 to 3¾ cables north-north-eastward of Tsing chau. Shallow draught vessels can cross Kellett bank at a distance of more than one mile northward of Tsing chau, in a depth of about 3½ fathoms (6m4).

Ngon shun chau, or Stonecutters island (page 464), lies on the bank which extends across the western end of the harbour and is separated from the western side of Kowloon peninsula by a channel, about 3¾ cables wide between the 3-fathom (5m5) lines in its narrowest part. Landing on the island is prohibited except to persons provided with passes.

The summit of Ngon shun chau, 231 feet (70m4) high, is situated at its western end. The coast is indented, and fringed by a bank, the extent of which can best be seen on the chart; on this bank there are several rocks above water. A rock, which dries 2 feet (0m6), lies one cable southward of White point, the southern extremity of the island, and is marked on its southern side by a can buoy, painted in black and white chequers. A reef, on which one of the rocks is 27 feet (8m2) high, extends about one cable south-eastward from the eastern extremity of the island; there is a white mark near the outer end of this reef, with a rock, with a depth of less than 6 feet (1m8) over it, nearly one cable south-westward.

Several sunken rocks lie between the eastern end of Ngon shun chau and the mainland north-eastward; Pinnacle rock, with a depth of 20 feet (6m1) over it, lies about one cable north-eastward of the north-eastern extremity of the island; Trocas rock, with a depth of 20 feet (6m1) over it, lies about 2 cables farther north-eastward; and Hankow rock, with a depth of 6 feet (1m8) over it, with a 17-foot (5m2) patch about half a cable southward, lies about one cable still farther north-eastward, and about 2 cables off the mainland.

Hankow rock is marked on its south-western side by a white buoy, surmounted by a triangle, marked "Hankow."

Vessels should keep clear of an area, indicated by pecked lines on the chart, in which there are submerged obstructions, extending about 5 cables southward from the southern side of Ngon shun chau.

Li chi kok (*Lat. 22° 20′ N., Long. 114° 08′ E.*) is an area of reclaimed land extending south-westward from a small inland promontory on the mainland, 254 feet (77m4) high, and lies about 5½ cables north-eastward of the northern extremity of Ngon shun chau. Basins for small craft are situated on the eastern side of Li chi kok, and some oil installations stand close westward. A tanker berth and two small jetties front the oil installations, and a pier, over one cable in length, is situated north-westward of them.

On the western side of Li chi kok there is a small bay; a jetty from which projects a small breakwater, with a floating structure close westward of it, is situated on the western entrance point of this bay. An islet, 7 feet (2m1) high, lies about a quarter of a mile north-westward of the last-mentioned point and is connected with the coast by a reef, which extends about one cable offshore, the north-western extremity of which dries 5 feet (1m5).

Between the south-eastern extremity of the reclaimed land at Li

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Chart 3280.

chi kok and the northern entrance of the typhoon refuge harbour, about 1¼ miles south-eastward, there is a bight, the eastern portion of which has mostly been reclaimed; depths of less than 3 fathoms (5^{m}5) extend offshore as far as the line joining the entrance points of this bight.

A submerged rubble breakwater, which uncovers one foot (0^{m}3) at low water, projects north-westward from the north-western end of the reclaimed area and is marked at its outer extremity by a dolphin; within the harbour thus formed the depths are very shoal, especially in its south-eastern part where there are some small jetties; there is a slipway on the north-eastern side. The built-up area of Sam shui po lies near the northern end of the reclaimed land; a pier projects from the sea wall fronting Sam shui po.

Tai kok tsui, a district about 3½ cables southward of Sam shui po, is fronted by reclaimed land near the centre of which is situated Cosmopolitan dry dock; the dry dock has a length of 462 feet (130^{m}8).

A typhoon refuge harbour, in which there are depths of from 6 to 21 feet (1^{m}8 to 6^{m}4), protected by a breakwater with two entrances, lies southward of Tai kok tsui. Yau ma ti, in which there is a police station, is situated at the south-eastern end of this harbour.

A bank, with depths of less than 3 fathoms (5^{m}5) over it, extends about one mile westward from the typhoon refuge harbour, leaving a narrow channel, with depths of over 3 fathoms (5^{m}5) between its north-western edge and the bank extending south-eastward from Ngon shun chau.

The portion of the harbour southward of the above-mentioned bank is described on page 486.

Lights. — Light-buoys. — Beacons. — The light on Tsing chau (*Lat. 22° 17′ N., Long. 114° 07′ E.*) is described on page 464.

A light-buoy painted red, exhibiting a *red flashing* light *every three seconds*, is moored 9 cables east-north-eastward of Tsing chau lighthouse, and 4 cables offshore; this light-buoy marks the western end of the Southern fairway into the harbour (page 487).

Two light-buoys marking the western end of the Central fairway into the harbour, are moored about 11 and 13 cables, respectively, north-north-eastward of Tsing chau lighthouse. The southern of these light-buoys is painted black and exhibits a *white flashing* light *every five seconds*; the northern light-buoy is painted red, and exhibits a *red flashing* light *every five seconds*.

Lights are exhibited, at elevations of 20 feet (6^{m}1), from tripods, 8 feet (2^{m}4) in height, from each side of the entrances to the typhoon refuge harbour at Yau ma ti.

Two lights are exhibited on the coast close northward of the typhoon refuge harbour and two lights are exhibited on the south-eastern side of Ngon shun chau; these lights mark the prohibited anchorage in this locality (page 489).

Two concrete beacons, one 16 feet (4^{m}9) in height and the other 20 feet (6^{m}1) in height, stand close westward and eastward, respectively, of the south-western of the two lights on the south-eastern side of Ngon shun chau.

Mooring buoys.—Eastward of the three light-buoys marking the western ends of the fairways into the harbour there are numerous mooring buoys, the numbers and positions of which can best be seen on the chart.

Charts 1466, 1180, 3026, 1962.

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Chart 3280.

Numerous mooring buoys are situated off the northern side of Ngon shun chau (page 481); those lying off the north-western side of the island are intended as typhoon moorings for small vessels; those lying in the bay off the north-eastern part of the island are intended as typhoon moorings for lighters.

See also page 489.

Anchorages.—Stonecutters anchorage, between Ngon shun chau and Kowloon peninsula, is much used during the typhoon season; all the large junks and many steamers take refuge there on the typhoon signal being made.

An examination anchorage, indicated by pecked lines on the chart, is situated, westward of the harbour limits, off the southern end of Tsing island; the other special anchorages indicated on the chart in the western end of the harbour are described on pages 490 and 491.

For prohibited anchorages, *see* pages 489-490.

Storm signals.—Local storm signals are exhibited at night on Ngon shun chau. *See* page 497.

Chart 3279.

Eastern end. — Dangers. — Beacons. — Buoys. — On the south-western side of the eastern end of Hong Kong harbour, Aldrich bay, divided into two by a projection, is entered between Kung Am (page 477) and Quarry point, 8 cables west-north-westward. Sau ki wan, which is usually thickly packed with junks moored in regular lines, is situated at the head of the western portion. A considerable portion of the western part of Aldrich bay was being reclaimed in 1945.

Quarry bay lies between Quarry point (*Lat. 22° 17′ N., Long. 114° 13′ E.*) and a point, on which there is a rock, 76 feet (23^{m}2) high, 7 cables west-north-westward. Taikoo shipyard, where there are docks, slips, and all requisites for repairs to vessels, is situated at Quarry point. A sugar factory, where there is a pier, is situated westward of the shipyard.

A rock, with a depth of 19 feet (5^{m}8) over it, lies 1¾ cables north-westward of the western entrance point of Quarry bay, and nearly one cable offshore; reclamation works, marked by dolphins, from which lights are exhibited, extended about half a mile in 1945, westward of this rock and nearly one cable offshore.

On the north-eastern side of the eastern end of Hong Kong harbour, between Siu chau wan and a point, about three-quarters of a mile north-westward, there are two small, shallow bays, divided from one another by a projection; Sam ka tsun is the south-eastern bay and Ma yau Tong the north-western.

A pinnacle rock, with a depth of 9 feet (2^{m}7) over it, marked on its northern side by Lei u mun beacon, lies about 4 cables north-westward of Siu chau wan and 1½ cables offshore; Lei u mun beacon is a white concrete pillar, surmounted by a staff and red globe.

A bank, with depths of from 19 to 34 feet (5^{m}8 to 10^{m}4) over it, extends about 1¼ cables north-westward from Lei u mun beacon.

Kowloon bay is entered on the northern side of the eastern end of Hong Kong harbour between the north-western entrance point of Ma yau Tong and a point about 2 miles west-north-westward.

A conspicuous white house stands on the north-western entrance point of Ma yau Tong, and about 3 cables farther north-westward is an oil installation, from the north-western corner of which a rubble

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Chart 3279.

mound extends about 4½ cables north-westward. There is a least depth of 3 feet (0m9) on the mound, and on its north-western extremity there is a pile platform.

The northern part of Kowloon bay is shallow and at its head is situated Kai Tak airport; the southern limit of the airport is indicated by a pecked line on the chart, extending across the bay in an east-west direction, about one cable southward of Channel rock (*see* below). A special quarantine anchorage lies close southward of the southern limit of the airport (*see* page 490). The city of Kowloon is situated on the western side of the bay.

On the south-western side of the bay and about 4 cables northward of the western entrance point, there are some cement works, with some chimneys, the easternmost of which is conspicuous. There are some small piers and a red mooring buoy in this portion of the bay.

Between an imaginary line joining the entrance points and the 5-fathom (9m1) line of soundings, northward of that line, there are several detached patches, with depths of 5 fathoms (9m1) and less over them; the positions and extent of these patches can best be seen on the chart.

Channel rock, 9 feet (2m7) high, with a rock, with a depth of less than 6 feet (1m8) over it, close westward, lies about 1½ miles north-westward of Siu chau wan and about 4½ cables westward of the western corner of the oil installation.

Channel rock, and the dangers surrounding it, are covered by the *red* sector of Blackhead hill light (page 487), between the bearings of 247° and 260°.

Elax rock, with a depth of 20 feet (6m1) over it, marked on its south-eastern side by a can buoy, painted in black and white chequers, lies 2¾ cables south-eastward of Channel rock. Vessels with a draught of more than 18 feet (5m5) are recommended not to pass between this buoy and Channel rock.

Kowloon rock (*Lat. 22° 19′ N., Long. 114° 12′ E.*), one foot (0m3) high, lies on the western side of Kowloon bay, about one mile north-westward of Channel rock and about 2¾ cables off the reclaimed land on the western side of the bay.

Kowloon rock is marked by a pole beacon, painted in red and black bands, surmounted by a red and black ball.

To kwo wan island, 72 feet (21m9) high and almost surrounded by boulders, one of which is conspicuous, lies about 3¾ cables west-south-westward of Kowloon rock, and is situated on a shallow spit which extends about 1¼ cables offshore.

Lights.—The lights on Siu chau wan and Kung Am are described on page 478.

A light is exhibited, at an elevation of 28 feet (8m5), from a white concrete beacon, 23 feet (7m0) in height, on Channel rock.

Anchorages.—For the Special quarantine anchorage and the Dangerous goods anchorage, *see* page 490.

Storm signals.—When local storm signals are displayed at Hong Kong, supplementary signals are displayed at the flagstaff situated at the northern end of the barracks on the hill eastward of Sau ki wan. *See* page 498.

Measured distance.—Beacons.—There is a measured distance of 6,080 feet (1,853m2) off the south-eastern side of Kowloon bay, the

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Chart 3279.

leading mark for which is Lei u mun beacon in line with Siu chau wan lighthouse, bearing 135½°. The depths on the running line are from 4¾ to 7 fathoms (8m7 to 12m8).

The south-eastern end of the measured distance is marked by two beacons, about 130 yards (118m9) apart in a 044½° direction, on the northern side of Ma yau Tong; the north-western end is marked by two beacons, about 220 yards (201m2) apart in a similar direction, on the mainland about three-quarters of a mile north-eastward of Channel rock.

Chart 1459.

Central portion of Hong Kong harbour.—Dangers.—Buoys.—On the southern side of the central portion of Hong Kong harbour, between a point, about 8 cables eastward of Tsing chau light (chart 3280) (page 464), and the Dockyard camber or basin, at the Royal Naval yard, about 2¼ miles eastward, a large number of piers extend for a short distance offshore; the positions of these can best be seen on the chart. The Director of Marine's office, near which there is a flagstaff, is situated about 7 cables west-north-westward of the Dockyard camber, and close south-eastward of the Canton Steamboat pier.

A chimney, 183 feet (55m8) high, which is conspicuous, stands near the centre of the Royal Naval yard.

A submerged obstruction, with a depth of 15 feet (4m6) over it, lies about 2 cables eastward of the Dockyard camber, and about one cable offshore.

Proserpine rocks, with a least depth of 9 feet (2m7) over them, extend about one cable from the reclaimed land on the southern side of the harbour, in a position about midway between the Dockyard camber and East point, about one mile eastward. There are some buildings and tall chimneys on East point.

Kellett island, 38 feet (11m6) high, on which are some buildings and a flagstaff, lies near the north-western end of a bank, with depths of less than 3 fathoms (5m5) over it, extending over 2 cables northward from East point. There are numerous rocks, some of which dry, between Kellett island and the southern shore. Vessels with a draught exceeding 3½ feet (1m1) are recommended not to use this channel.

A rock, with a depth of 16 feet (4m9) over it, lies about 1¼ cables westward of the flagstaff on Kellett island (*Lat. 22° 17′ N., Long. 114° 11′ E.*).

A conical buoy, painted in black and white chequers, is situated about 1½ cables east-south-eastward of the flagstaff on Kellett island.

Tung lo wan, or Causeway bay, protected by a breakwater, 9 feet (2m7) high, which lies on the eastern side of East point, forms a refuge for small craft in bad weather. The bottom, at the head of Tung lo wan, consists of sand and mud, and dries in patches. A bank, with depths of less than 30 feet (9m1) over it, extends about 4¼ cables north-north-westward from Tung lo wan breakwater, and there are two 23-foot (7m0) patches lying about 4 cables north-north-westward of the western extremity of the breakwater.

A pier, about three-quarters of a cable long, with a small camber close south-westward, extends offshore from a position about 1¼ cables north-eastward of Tung lo wan; there is a depth of about 20 feet (6m1) at the head of the pier, near which there are four dolphins.

Charts 3280, 1466, 3605, 1180, 3026, 1962.

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Chart 1459.

Rambler shoal, with a least depth of 27 feet (8m2) over it, lies about 2 cables northward of the pier and from 1½ to 2½ cables offshore.

A bank, with depths of 30 feet (9m1), and less, over it, extends about 1½ cables off the reclaimed land from a position about three-quarters of a cable eastward of Tsat tsz mui or North point, situated about 3 cables north-eastward of the pier mentioned on page 485.

On the northern side of the central portion of Hong Kong harbour, Tsim tsa tsui, the south-western extremity of Tsim sha tsui, the name given to the southern end of the Kowloon peninsula, near which is the railway clock-tower which is very conspicuous, situated about 7 cables northward of the entrance of the Dockyard camber. The western side of the peninsula, between Tsim tsa tsui and the southern entrance of the typhoon refuge harbour (page 482), is mostly occupied by coaling sheds. There is a coaling camber, about 3 cables southward of the typhoon refuge harbour, and there is an oiling jetty on the western side of the coaling camber arm. The Royal Naval depôt, fronted by a small camber, lies southward of the coaling camber. Five numbered piers extend offshore between the Royal Naval depôt and Tsim tsa tsui.

Several patches, with depths of 36 feet (11m0) over them, lie within 6 cables of the western side of Tsim sha tsui. Three obstructions lie between these patches and the western side of Tsim sha tsui; the northern one has a depth of 25 feet (7m6) over it, and the others 27 feet (8m2), situated about 3¾, 3½ and 2½ cables, respectively, west-north-westward of Tsim tsa tsui.

Tai tau mai, or Blackhead's point, the south-eastern extremity of Tsim sha tsui, lies about 4 cables eastward of Tsim tsa tsui. Kowloon railway station, with a conspicuous hotel close northward, is situated between these points.

The clock-tower of the telephone house, situated about 3½ cables north-westward of Tai tau mai, is conspicuous.

Holt's wharf, which comprises three small basins protected by two deep-water quays, lies close westward of Tai tau mai; there is a least depth of 31 feet (9m4) alongside the outer quay, and depths of from 6 to 28 feet (1m8 to 8m5) inside the basins.

A conspicuous white tower stands on Blackhead hill (*Lat. 22° 18′ N., Long. 114° 10′ E.*), about 1¼ cables north-westward of Tai tau mai; there are several flagstaffs and an old lighthouse, 31 feet (9m4) in height, on this hill.

Hung Hom wan lies on the south-eastern side of Kowloon peninsula between Tai tau mai and the western entrance point of Kowloon bay (page 483), about one mile north-eastward. On the western side of Hung Hom wan, the Royal Observatory, near which is a conspicuous radio mast, stands about half a mile northward of Tai tau mai and a quarter of a mile inland. St. Andrew's church, which has a white spire, stands about one cable westward of the Royal Observatory. The town of Hung Hom, and the Kowloon docks, are situated on the north-eastern side of the bay; in addition to quayage, the docks comprise one large and two smaller dry docks and several building slips. There are some 80-ton sheers at the docks, and a conspicuous 100-ton Titan crane. The eastern entrance point of the bay is occupied by slips.

A bank, with depths of less than 18 feet (5m5) over it, extends about 4 cables southward from the head of Hung Hom wan.

Charts 1466, 3605, 1180, 3026, 1962.

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Chart 1459.

Cust rocks, a sunken patch, lie close off the extremity of the last-mentioned shoal, 4½ cables north-eastward of Tai tau mai. The rocks, and the southern extremity of the shoal on which they lie, are covered by the *red* sector of Blackhead hill light, Kowloon (*see* below), between the bearings of 247° and 260°.

Rumsey rock, 5 feet (1m5) high, lies less than one cable northward of Cust rocks, with shallow patches between. Some rocks, with depths of from 2 to 5 feet (0m6 to 1m5) over them, extend about a quarter of a cable north-westward from Rumsey rock and are marked by a white conical buoy on their north-western side. A shoal, with a depth of 3 feet (0m9) over it, lies close south-westward of Rumsey rock, and a 6-foot (1m8) patch lies about a quarter of a cable westward of the same rock.

Midway between Rumsey rock and the shore north-westward there are two patches, with a depth of 6 feet (1m8) over them; a rock, one foot (0m3) high, lies three-quarters of a cable farther north-westward, and close off the end of a drying rocky shoal which extends offshore.

Lights.—Lights are exhibited from most of the piers extending from the southern side of the harbour from the following positions:—From the extremity of each of the arms forming the entrance to the Dockyard camber; at the head of the Asiatic Petroleum Company's pier, situated about half a mile north-eastward of Kellett island; the southern extremity of the coaling camber arm; on each side of the entrance to the basin at the Royal Naval depôt; from each of the posts marking the prohibited anchorage between Kowloon and Hong Kong island; at each end of Holt's wharf; and on the extremity of Tai tau mai.

The lights exhibited at the southern entrance of the typhoon refuge harbour, situated on the western side of Kowloon peninsula, are described on page 482.

A light is exhibited, at an elevation of 145 feet (44m2), from a conspicuous white tower on Blackhead hill (*Lat. 22° 18′ N., Long. 114° 10′ E.*).

A light for the use of aircraft is exhibited from the head of the radio mast at the Royal Observatory; this light should not be confused with the storm signals. *See* page 498.

A light is exhibited, at an elevation of 26 feet (7m9), from a black and white chequered stone tower on Cust rocks.

Signal stations.—Water Police.—Signal stations, for communication by lamp, are situated on Blackhead hill, and at the Director of Marine's office; messages are passed, by day and night, free of charge, between vessels and their agents, the Director of Marine, Police, Port Health authorities, and Fire Brigade, etc.

Vessels requiring the assistance of the Water Police, to deal with emergencies, should communicate with either of the above signal stations.

Charts 1459, 3280.

Fairways.—There are two fairways through the harbour for vessels over 60 tons.

The Southern fairway, the western end of which is situated abreast the gas works, about 1¼ miles eastward of Tsing chau, and the eastern end abreast Vehicular pier, about 1¼ miles farther eastward, is bounded on its southern side by the northern coast of Hong Kong island. The northern side of this fairway is bounded by a junk anchorage

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Charts 1459, 3280.

and a line of mooring buoys. The light-buoy at the western end of this fairway is described on page 482.

The Central fairway is defined by two lines of mooring buoys, for the use of merchant vessels, extending in an east-south-easterly direction. The two light-buoys marking the western end of the Central fairway are described on page 482.

The Northern fairway lies between two lines of mooring buoys immediately northward of the Central fairway.

Vessels of over 60 tons, proceeding through the Southern fairway, display numeral pendant 4 of the International Code of Signals, those proceeding through the Central fairway, numeral pendant 1 of the International Code of Signals, and those proceeding through the Northern fairway, numeral pendant 2 of the International Code of Signals, at their highest masthead.

Vessels crossing a fairway shall avoid vessels proceeding through that fairway and displaying the appropriate pendant. Subject to the above regulation all vessels, irrespective of size, shall, whether in a fairway or not, observe the International Collision Regulations and no vessel whatsoever shall anchor in any of the fairways, or in their direct approaches.

Chart 1459.

Tides and tidal streams.—The tides at Hong Kong are influenced by a very large diurnal inequality. The average range of the two tides of the day is greatest about a day after full or new moon, while the inequality is greatest about two days after the moon reaches its maximum declination north or south of the equator. In January and July the two maxima occur on or about the same day and, in consequence, in these months the highest high waters and the lowest low waters of the year occur. In January the higher high water occurs in the evening and the lower low water in the early morning, while in July the higher high water occurs in the forenoon and the lower low water in the afternoon.

In April and October the greatest inequality occurs on days when the average range of the two tides is least. On such days the inequality may be sufficient to bring the lower high water and the higher low water to the same level and, in consequence, there will be only one high water and one low water on these days.

The higher high water nearly always precedes the lower low water, except at the period between one and three days after the moon crosses the equator.

The height of the tide is affected by meteorological conditions, and strong winds may raise or lower the level by a foot or more.

In the fairway of the channel and harbour between Lei u mun and Tsing chau (*Lat. 22° 17′ N., Long. 114° 07′ E.*), the stream sets westward with a rising, and eastward with a falling tide, changing in direction at about high and low water. The rate at times reaches 2 knots, and in Lei u mun as much as 3 knots with favourable winds and tides. In the man-of-war anchorage off the Royal Naval yard, it is from one to 2 knots, and off the dry dock as much as from 3 to 3½ knots has been observed during the west-going stream, and a nasty sea is caused for a distance of about a cable off the outer wall of the dockyard camber at times. During the strength of the stream, it must be guarded against when going to a buoy.

Charts 1466, 1180, 3026, 1962.

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Chart 1459.

During the flood tide, the stream sets strongly in a west-south-westerly direction across the western end of the northern arm of the Royal Naval yard; on the ebb tide, the stream sets off the northern arm in about a 100° direction; the stream is usually slack in the vicinity of the arm at about low water and from one to two hours before high water, and these are the most suitable times for a vessel to berth at the northern arm. During the ebb tide, there is sometimes an eddy, in a westerly direction, off the eastern end of the northern arm.

In the various bights the tidal stream is weak and irregular.

Off the oiling jetty near the Royal Naval depôt, the tidal stream was reported in May, 1936, to turn 2 hours before high and low water. *Charts 1459, 3279, 3280.*

Anchorages. — Moorings. — Caution. — By the port regulations vessels are berthed under the superintendence of the Director of Marine; the Harbour limits are described on page 480.

Two anchorages, indicated on the chart by pecked lines, are reserved for men-of-war, one north-eastward of the Royal Naval yard, and the other, westward of the coaling camber, on the western side of Kowloon peninsula. The latter anchorage is reserved for small harbour oilers and water boats.

During the typhoon months, the north-western part of the harbour is considered preferable because of the shelter afforded by Kowloon peninsula from the wind which blows hardest from north-eastward. For harbours of refuge, *see* page 482.

Moorings are laid down off the Royal Naval yard, Hong Kong, and off the Royal Naval depôt (*Lat. 22° 18′ N., Long. 114° 10′ E.*), Kowloon, for the use of H.M. vessels.

Numerous mooring buoys for merchant vessels are maintained by the Government, several of which are fitted specially for use during typhoons. (*See* also page 483.) Vessels using these buoys must secure to them with their chain cable.

When any black signal is hoisted, other than signal No. 1 (*see* pages 497-498), vessels secured to Government buoys, not being special class typhoon mooring, shall move to a typhoon anchorage, or to a special typhoon mooring buoy, within two hours following the hoisting of such signal.

Two mooring buoys, situated near the head of Cheung kwan o (page 478), are reserved as typhoon moorings for the craneship *Seisyu maru* (*see* page 496).

For examination anchorages, *see* pages 478 and 483.

Chart 3280.

Prohibited anchorages.—Vessels are prohibited from anchoring without permission from the Director of Marine, in the Southern, Central or Northern fairways, or in the western approaches thereto, within the area enclosed by the following boundaries:—

On the north by a line drawn 310° from the northern Central fairway light-buoy; on the south by a line drawn 202° from the Southern fairway light-buoy; on the west by the western boundary of the harbour. *See* page 480.

Anchorage is prohibited in the area enclosed by pecked lines on the chart, between Ngon shun chau and Tai kok tsui. This area is marked by beacons, from which lights are exhibited, situated, two on the

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Chart 3280.

south-eastern side of Ngon shun chau, and two on Tai kok tsui, each pair being about 1½ cables apart. *See* also on page 482.

Chart 1459.

Anchorage is prohibited, owing to the existence of a fresh-water pipe line and telegraph cables, in the area enclosed by pecked lines shown on the chart, between Kowloon and Hong Kong island.

The western limit of the above prohibited anchorage is marked by posts, surmounted by white diamonds, from which lights are exhibited, situated on the south-eastern corner of the police barracks, on Kowloon peninsula, 1½ cables north-eastward of Tsim tsa tsui; on the southern end of the public pier, south-westward of the police barracks; and at the head of Vehicular pier, Hong Kong island, about 5 cables westward of the entrance to the Dockyard camber. The eastern limit is marked by a post, surmounted by a white diamond, from which a light is exhibited, about 1½ cables south-westward of the tower on Blackhead hill, on Kowloon peninsula, and by a post on Hong Kong island, from which a light is exhibited, situated on the north-western corner of the Law Courts, about 2½ cables westward of the Dockyard camber. The above-mentioned lights are visible only over the prohibited anchorage.

Anchorage is prohibited in the area, enclosed by pecked lines on the chart, between the rocks on either side of Kellett island and the southern side of the harbour.

Anchorage is prohibited, due to the existence of submarine cables in the area between the pecked lines on the chart drawn across the harbour from positions on the Hung Hom peninsula about 8½ cables north-eastward and 6½ cables east-north-eastward of Cust rocks in a south-south-easterly direction to the southern shore.

Chart 3279.

Anchorage is prohibited, except when any Local typhoon signal, other than No. 1, is hoisted, eastward of a line drawn 000° from a position 7 cables 180° from Kowloon rock, and northward of a line drawn 090° from the same position. Permission to enter this area may be obtained by signal from either the Director of Marine's office or Blackhead signal station (*Lat. 22° 18′ N., Long. 114° 10′ E.*).

Chart 3280.

Quarantine anchorages.—The quarantine anchorage is situated southward of Ngon shun chau, in the western portion of the harbour, and the master of every vessel shall remove his vessel to any part of the quarantine anchorage as and when required by the Director of Marine; its boundaries are indicated by pecked lines on the chart.

Charts 1459, 3279.

There is a Special quarantine anchorage in the eastern portion of the harbour, situated in the entrance of Kowloon bay; its boundaries are indicated by pecked lines on the chart. In order not to interfere with the movement of flying boats using the bay, vessels anchoring here should make every endeavour to do so along the southern limit of this area which is the parallel of lat. 22° 18′ 12″ N. The limit lies northward of the southern edge of the *red* sector of Blackhead hill light, between the bearings of 247° and 260°.

See also quarantine regulations, page 493.

Charts 3279, 3280, 3632.

Dangerous goods anchorages.—There are three dangerous goods anchorages.

Charts 1466, 1180, 3026, 1962.

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Charts 3279, 3280, 3632.

The Northern anchorage is situated southward of Li chi kok within the area indicated by pecked lines on charts 3280 and 3632.

The Western anchorage is situated southward of, and adjoining, the quarantine anchorage southward of Ngon shun chau.

The eastern anchorage is situated on the eastern side of Kowloon bay near Channel rock, within the area indicated by pecked lines on chart 3279.

Charts 1459, 3280.

Harbours of refuge.—There are two harbours of refuge for small craft, the Typhoon refuge harbour (page 482), and Tung lo wan (page 485).

Pilots.—All pilots at Hong Kong are licensed by the Director of Marine.

Pilots for Macao, Canton, and the Hsi chiang can be obtained at Hong Kong.

Directions.—*Western entrance.*—Having approached the western entrance as directed on page 479, the best entrance for steam vessels of moderate draught is through Sulphur channel.

To proceed northward of Kellett bank from a position westward of Tsing chau, a vessel should keep the summit of Pok liu chau (chart 1466), bearing 168° and open westward of Tsing chau, or, at night, should keep Tsing chau light (*Lat. 22° 17′ N., Long. 114° 07′ E.*) bearing less than 164°, until within half a mile of Tsing island, and then steer north-eastward, bringing Devil's peak (page 478) in line with White point, the southern extremity of Ngon shun chau, bearing 102°, when she should steer on that alignment until the eastern extremity of Tsing chau is in line with Shektong tsui, bearing 175°; course may then be shaped in a south-easterly direction towards the Central fairway.

Vessels berthing at the northern arm of the Royal Naval yard should pay due regard to the tidal streams, described on page 489.

Charts 1459, 3279.

Eastern entrance.—Having approached the eastern entrance through Tathong channel as directed on page 479, and having passed through Lei u mun, a vessel should avoid the pinnacle rock (page 483) which is marked by a beacon, and the 19-foot (5^{m}8) rock, situated near the western entrance point of Quarry bay, and the bank extending off the reclaimed land farther westward; she can then proceed to the anchorage, passing between Cust rocks and Rambler shoal and north-westward of the spit extending from Tung lo wan breakwater.

For extracts from Port regulations, *see* page 492.

Charts 1459, 3279, 3280.

VICTORIA.—The city of Victoria, known as Chung wan by the Chinese, occupies nearly the whole of the southern side of Hong Kong harbour between Belcher bay and Kellett island.

Royal Naval yard.—Traffic regulations.—The Dockyard camber, or tidal basin, at the Royal Naval yard, has depths of from 30 to 32 feet (9^{m}1 to 9^{m}8) in the middle, and not less than 18 feet (5^{m}5) alongside.

A dry dock is situated close westward of the basin.

When a vessel is about to enter the basin in H.M. Dockyard, a red square flag will be displayed at the Dockyard signal station on the

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Charts 1459, 3279, 3280.

West wall of the Dockyard; when a vessel is about to leave the basin a black ball over a red square flag will be displayed. These signals will also be displayed at a mast at the western end of the North wall of the basin.

A blue square flag is displayed at the Dockyard signal station when docking or undocking is taking place. Vessels docking under their own power are not to enter unless this flag is displayed at the masthead.

If a vessel is undocking at night a *red* light will be exhibited from the Dockyard signal station immediately before the undocking, and a *green* light while the undocking is in progress.

All vessels passing on these occasions must keep off the entrance to basin or dock, as the case may be.

Port regulations.—The following are extracts from the more important of the Port regulations:—

The depositing of rubbish, oil or other substance into the waters of the harbour is prohibited.

Typhoon regulations.—During the typhoon season, from the 1st of June to the 15th of October, all vessels within the harbour limits shall, when any typhoon signal (*see* page 497) is shown, immediately clear away anchors and cables and raise steam on the main engines to such extent as may be possible in the circumstances.

When any typhoon signal, other than No. 1, is hoisted, all vessels at Government buoys, which are not at the time classified as typhoon buoys, and vessels berthed alongside wharves or quays, shall shift to an anchorage, or to a typhoon buoy, as soon as possible after the showing of such signal. Masters may, however, if conditions appear safe, apply to the Director of Marine for permission to remain at a typhoon buoy for a limited period in hours of daylight, if by doing so they would be enabled to complete discharge or loading of cargo. Permission would normally be granted only in the case of a vessel intending to sail immediately on completion of such work.

It shall be lawful for the Director of Marine to order any vessel at a typhoon buoy, or at any berth in the harbour, to give place to any other vessel whenever, in his opinion, the circumstances justify such an order.

Masters or their agents requesting a buoy are advised to ascertain whether it is considered safe for use under typhoon conditions.

Nothing in these regulations shall prevent any vessel which is already at a typhoon buoy from shifting to an anchorage if such is preferred.

2 (2). A radio direction-finding calibration range exists in the area southward of Tsing chau (*Lat. 22° 17′ N., Long. 114° 07′ E.*). The diameter of the range is 2½ miles and the centre, situated about 1½ miles south-south-westward of that island, is marked by a buoy painted with a black and white superstructure. Vessels approaching shall avoid this area while the range is in use.

3. No vessel shall pick up or discharge a pilot within a distance of 7½ cables from the centre either of Lei u mun pass or of Sulphur channel.

4. Any vessel to which the International Code signal " K " is made by flag, sound or flashing lamp by a Marine Department, Police or Revenue Department launch, or by a Government signal station, shall stop until authorised to proceed.

Charts 1466, 1180, 3026, 1962.

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Charts 1459, 3279, 3280.

10. Every vessel carrying or loading dangerous goods shall keep hoisted by day a red flag at the fore truck, and by night a *red* light at a height of not less than 20 feet above the upper deck. Every vessel carrying or loading bulk oil shall in addition fly the International Code flags "R K O."

21. All vessels under way in the harbour shall proceed with due caution and shall not exceed a speed of 10 knots unless circumstances render a greater speed imperative.

25 (1). Every vessel exceeding 60 tons (except vessels plying solely within the waters of the Colony) shall, when under way within those waters during hours of daylight, keep her signal letters or identification flags hoisted.

25 (2). Every such vessel under way in the waters of the Colony during hours of darkness shall identify herself if required to do so by any Government signal station, or Marine, Police or Revenue launch, or any British warship.

25 (3). Every such vessel intending to leave any berth in the waters of the Colony during hours of daylight shall hoist her signal letters at least 30 minutes before the estimated time of departure.

With the exception of explosives, a vessel is normally allowed alongside a wharf with up to 5 tons of dangerous goods aboard, and may proceed to any buoy or anchorage with a maximum of 50 tons of dangerous goods. Should a greater quantity be carried it is required to remove the excess while the vessel is in the Dangerous goods anchorages.

Quarantine regulations.—1.—In these regulations, the term "Health Officer" means the Health Officer of the Port, or any other medical officer, duly authorised to act for, or assist him, or in charge of any place set apart for the detention and seclusion of persons actually suffering from disease; the term "Vessel" includes British and foreign ships of war, as well as all other vessels; the term "port or place of which any infectious or contagious disease prevailed" means a port or place proclaimed to be such by order of the Governor in Council published in the *Gazette* from the date of such proclamation. The words "infectious or contagious disease" shall, for the purposes of these regulations, mean cholera, choleraic diarrhœa, smallpox, typhus fever, yellow fever, bubonic plague, and any such other epidemic disease as the Health Officer may consider to imperil the safety of the passengers or crew. The term "infected vessel" shall mean any vessel which has a case of any of the above-mentioned diseases on board or on which any case of any such diseases has occurred within a period of sixteen days in the case of smallpox previous to the date of arrival of the vessel in the waters of the Colony, or in the case of cholera, yellow fever or plague, when such period shall be seven days; the term "suspected vessel" shall mean any vessel on which any case of any of the above-mentioned diseases has occurred at the time of departure or during the voyage, but on which no fresh case has occurred within a period of sixteen days in the case of smallpox, or in the case of cholera, yellow fever and plague seven days, previous to the date of arrival of the vessel in the waters of this Colony; the term "healthy vessel" shall mean any vessel which, having come from a part or place at which any infectious or contagious disease prevailed, has had no death from, and no case of any such disease on

Charts 1466, 1180, 3026, 1962.

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Charts 1459, 3279, 3280.

board while at such port or place or during the voyage therefrom, or on arrival.

2.—Every "infected," every "suspected," and every "healthy" vessel on entering the waters of this Colony shall fly and keep flying the appropriate signals of the International Code of Signals, and shall not communicate with the shore until granted pratique by express written order of the Health Officer who shall board every such vessel and shall examine all the passengers and crew thereof. Provided, nevertheless, that any such vessel, which is on a voyage to any other place and which has held no communication with the shore except as permitted by these regulations, may, with the written consent of the Health Officer, proceed on such voyage or tranship her passengers for the purpose of completing such voyage.

3.—Every "infected," every "suspected," and every "healthy" vessel shall, unless previously granted pratique, proceed at once to the Quarantine anchorage and shall not remove therefrom, except from stress of weather, until released by order of the Health Officer. No vessel which is compelled to leave the Quarantine anchorage from stress of weather shall communicate except by signals with the shore or with any other vessel, and such vessel shall return to the Quarantine anchorage immediately such stress of weather has subsided: Provided that in case of stress of weather involving probable actual danger to the vessel, the vessel may remove for a time, but shall be deemed, nevertheless, for all purposes to be subject to all other regulations applicable to such vessels.

No such vessel shall enter the harbour limits before 0600 or after 1800.

For Quarantine anchorages, *see* page 490.

Explosives.—It shall not be lawful for the Master of any vessel without the permission of the Director of Marine, to anchor such vessel within 500 yards (457m2) of any Government Gunpower Depôt.

The Master of every vessel having onboard as cargo gunpowder, or other explosives, and whilst engaged in the transhipment of the same, shall display a red flag at the highest masthead.

It shall not be lawful for the Master of any vessel, having onboard as cargo, gunpowder or other explosives, to anchor within 500 yards (457m2) of any other vessel except by permission of the Director of Marine.

Case oil.—Every vessel arriving at any port in this Colony having on board case oil, and every vessel being about to take on board such oil from licensed premises, shall hoist a red flag at her fore-truck, and the flags RKO of the International Code of Signals at her main truck, and shall keep such flags flying during the hours of daylight whilst any case oil is on board, and thereafter until the Director of Marine is satisfied that the holds are clean and ventilated. And during the same period every such vessel shall by night display two *red* lights vertically, where best seen, and at a height of not less than twenty feet (6m1) above the deck.

Every vessel having on board case oil shall anchor in one of the prescribed Dangerous Goods anchorages, and shall obtain permission from the Director of Marine before going alongside any wharf, or shifting berth.

For Dangerous goods anchorages, *see* page 490.

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Charts 1459, 3279, 3280.

The Standard Oil Co.'s Wharves at Li chi kok and Lap sap wan, and the Asiatic Petroleum Co.'s wharves at Tsat tsz mui (*Lat. 22° 18′ N., Long. 114° 12′ E.*) and Tai kok tsui, shall be the places to which vessels having, or being about to take, on board, case oil, may proceed, with the permission of the Director of Marine. Otherwise such case oil must be discharged or shipped in one of the Dangerous goods anchorages.

After the discharge of case oil, the vessel, unless she at once goes to sea, shall remain at, or proceed without delay to, one of the Dangerous goods anchorages; and shall not remove therefrom until all her holds which have contained case oil shall have been thoroughly cleansed and ventilated by the removal of all oil and vapour, unless the special permission of the Director of Marine has been obtained, except for the purpose of proceeding to sea, or through stress of weather.

Yachts.—Masters of all yachts must report their departure and arrival as follows:—

(*a*) A departure to a place outside the waters of the Colony must be notified to the Director of Marine.

(*b*) An arrival from a place outside the waters of the Colony must be reported within 24 hours to the Director of Marine.

In case of yachts of 60 tons register and over, such arrival must be reported to the Port Control office, and in the case of yachts of less than 60 tons register to the Marine Licensing office. Both these offices are situated in the Marine office.

Trade.—Shipping.—Hong Kong is a free port, except as regards the importation of spirits and tobacco.

The principal exports are tea, rice, camphor, silk, sugar, soap and cement. The chief imports are coal, iron, sugar, hardware, cotton, and woollen goods, petroleum, etc.

In 1950, 67,000 vessels of 23,250,000 net tons entered and cleared the port; of these, 43,000 vessels, with a tonnage of 22,250,000, were engaged in foreign trade.

Port facilities.—A large quantity of coal is kept in stock; it can be supplied either alongside or at anchor, at a rate of about 2,000 tons in 24 hours.

At piers, Nos. 1 to 5 southward of the coaling camber, there is berthing for vessels of deep draught and from 450 to 1,000 feet (137^{m}2 to 304^{m}8) long; vessels of 30 feet (9^{m}1) draught can berth alongside No. 5 pier. There is also a small pier with a **T** head, which has a depth of 16 feet (4^{m}9) alongside.

The depths in the approach to the piers can best be seen on the chart. The most suitable time for berthing at these piers is, if going alongside the southern sides, from half an hour before to three hours after low water, and, if going alongside their northern sides, from three hours before to half an hour before low water.

H.M. ships are coaled from lighters. Vessels cannot coal alongside any of the wharves on the southern side of the harbour.

A large stock of fuel oil is maintained. There are berthing facilities for three vessels alongside the oil installations. Quantities up to 600 tons an hour can be delivered to a vessel alongside the wharf, and 350 tons an hour from lighters.

There is a dry dock at the Royal Naval yard (*Lat. 22° 17′ N., Long. 114° 10′ E.*), and a floating dock, with a length of about 380 feet

Charts 1466, 1180, 3026, 1962.

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Charts 1459, 3279, 3280.

(115m8) and a beam of 72 feet (21m9), is moored about 2 cables eastward of the entrance to the Dockyard camber. At the Kowloon docks, situated in Hung Hom wan, there are three docks and three slips. The Cosmopolitan dry dock is situated at Tai kok tsui. Taikoo dry dock and three slips are situated near Quarry point. For details of the dry dock, *see* Appendix I. For the dry dock and docks at Aberdeen, *see* page 470.

Repairs to the largest vessels and to machinery and boilers can be undertaken.

A crane-ship, named "*Seisyu maru*," capable of a lift of 140 tons, is available in the harbour.

There is a length of 2,500 feet (762m0) of wharfage in Hung Hom wan, where there are ten deep-water berths, which can accommodate vessels up to 750 feet (228m6) in length, with a maximum draught of 32 feet (9m8); there is a 100-ton crane with a depth of 24½ feet (7m5) alongside it, and an electric crane of 10 tons capacity. In the vicinity of the Cosmopolitan dry dock there are 550 feet (167m6) of wharfage, with depths of from 8 to 15 feet (2m4 to 4m6) alongside, deepening rapidly off the wharf, and steam sheers of 20 tons capacity.

For Holt's wharf, *see* page 486.

At Taikoo shipyard, there is a length of 3,200 feet (975m4) of quayage, with a depth of 39 feet (11m9) alongside. There is a 150-ton crane, and travelling cranes with lifting capacities of 30, 25 and 10 tons.

At Tsat tsz mui (page 486), there is berthing space for three vessels drawing 30 feet (9m1) alongside a total quayage of 1,223 feet (372m7).

Fresh provisions and water of excellent quality may be obtained.

Health.—Deratisation.—The principal diseases causing death in the Colony, during 1933, were bronco-pneumonia, pulmonary tuberculosis, bronchitis, and diarrhœa; there is still some malaria.

Every year, in the cold season, smallpox manifests itself in outbreaks which decline or disappear with the advent of summer.

There are three Government hospitals. Seamen are admitted to the Government Civil hospital. There is a small hospital for infectious diseases in the western part of the city of Victoria.

For deratisation, *see* page 35.

Communication.—Kowloon is connected by railway with Canton; and Hong Kong is connected by telegraph to all parts of the world.

Regular steamship communication is maintained with all parts of the world.

There is a radio station at Cape d'Aguilar. *See* page 28.

Magnetic observations.—The magnetic observatory is situated close westward of the Royal Observatory.

Climatic table.—*See* page 59.

Weather reports.—Weather reports are displayed, daily, at the Director of Marine's office, the General Post Office, the offices of the cable companies, and the ferry piers.

Time signal.—A time signal is made from the Royal Observatory at Kowloon. For details, *see* Admiralty List of Lights, Vol. 6.

Storm signals.—The China Seas Storm Signal Code, described on page 497, is used at Hong Kong, and also a Local Storm Signal Code.

The China Seas Storm Signals are displayed at Blackhead hill (*Lat. 22° 18′ N., Long. 114° 10′ E.*) and on the roof of No. 49 godown, situated near the inner end of No. 1 pier, about one cable northward of Tsim tsa tsui.

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The Local Storm Signal Code is as follows:—

DAY SIGNALS.

Signal. No.	*Symbol.*	*Meaning.*
1	T	A depression or typhoon exists which may possibly affect the locality.
2	—	Strong wind with squalls may possibly occur from the S.W. (between South and West).
3	⊥	Strong wind with squalls may possibly occur from the S.E. (between South and East).
4	◆	Typhoon dangerous but danger to locality not imminent.
5	▲	Gale expected from the N.W. (between North and West).
6	▼	Gale expected from the S.W. (between South and West).
7	▲ ▲	Gale expected from the N.E. (between North and East).
8	▼ ▼	Gale expected from the S.E. (between South and East).
9	⧗	Gale expected to increase.
10	✚	Wind of typhoon force expected (any direction).

NIGHT SIGNALS.

Signal No. ..	1	2	3	4	5
Light	WHITE	WHITE	GREEN	WHITE	WHITE
Light	WHITE	GREEN	WHITE	WHITE	GREEN
Light	WHITE	WHITE	GREEN	RED	GREEN

Signal No. ..	6	7	8	9	10
Light	GREEN	GREEN	WHITE	GREEN	RED
Light	WHITE	GREEN	WHITE	GREEN	GREEN
Light	WHITE	WHITE	GREEN	GREEN	RED

Signals Nos. 2, 3, and 4 are not used in Hong Kong; signal No. 9 is not used in Manila.

Local typhoon signals in full are displayed at the Royal Observatory, Director of Marine's office and Royal Naval dockyard. Day signals are displayed at Tsing chau and the Hong Kong and Kowloon wharf and Godown Company. Night signals are exhibited at the Kowloon Railway station, Hong Kong and Whampoa Dock Company, on Ngon shun chau, and on the barracks at Lei u mun, situated about a quarter of a mile south-south-westward of Kung Am light-structure (*Lat. 22° 17′ N., Long. 114° 14′ E.*).

Signal No. 1 is a cautionary or "stand by" signal, and does not necessarily imply bad weather. Signals Nos. 5 to 8 convey definite warning of expected gales and will not be hoisted until such gales are probable at Wenwei chou or Gap rock and Hong Kong, or when a typhoon is sufficiently near to the Colony to warrant a danger signal, although the occurrence of a gale may be uncertain.

Signal No. 10 will be accompanied by three explosive bombs fired

Charts 1466, 1180, 3026, 1962.

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Charts 1459, 3279, 3280.

at intervals of *ten seconds* at the Water Police station and at the Director of Marine's office. It will be displayed as early as possible when wind of typhoon force (80 m.p.h.) is expected; in many cases, therefore, No. 9 will not be utilised.

Signals will be lowered when danger is considered to be over.

Supplementary signals.—When Local storm signals are displayed in Hong Kong, supplementary signals are displayed in the vicinity as follows:—

When No. 1 signal is displayed in the harbour; A red **T** by day, and a *red* light above a *green* light by night.

When signals Nos. 5 to 10 are displayed in the harbour; A red cone, apex upwards, by day, and 2 *green* lights, disposed vertically, by night.

The Supplementary signals are displayed at the following:—

Wenwei chou	Sai kung
Cheung chau	Tai yu ngaam teng
Chik chu or Stanley	Tai po
Aberdeen	Sha tau kok
Wang lan	Tsun wan
Sau ki wan	Tai o

They are also displayed on Police cruising launches and on Police launches Nos. 5 and 6.

For typhoon regulations, *see* page 492.

The following signals by flags of the International Code of Signals, or by lights at night, may be shown by merchant vessels in cases of emergency:—

By day, flags ST and, at night, a *red* light between two *white* lights, disposed vertically, indicate that police assistance is required; the day signal may be supplemented by flags NQ, meaning "Fire on board," or by flags RX, meaning "Assistance required—Mutiny"; the night signal may be supplemented by a flare, burnt every minute, meaning "Fire," or a *blue* light, meaning "Mutiny"; the continuous sounding of any fog signal apparatus may, in addition, be adopted to attract attention to the signals.

For calling the police on board in the waters of the Colony, flag S should be displayed at the fore.

The signal RX, above, should be displayed in case of extreme emergency only.

For calling the Health Officer on board, M flag above the Code pendant should be displayed.

For calling the Passport Authorities on board, S flag above the answering pendant should be displayed.

Caution.—The China Seas Storm Signal Code necessitates a mast-head symbol which should not be mistaken for a black signal of the Local Storm Signal Code.

Signals to be displayed by vessels engaged in dredging or boring operations.—All vessels engaged in salvage, dredging, boring, or in repairing or overhaul of moorings, within the waters of the Colony, shall show the signals hereinafter mentioned to indicate the nature of the work on which they are employed:—

By day.—A black ball at the foremast head and a black ball at the yard-arm on the side, or sides, on which it is safe to pass. A red flag

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to be displayed at the yard-arm on the side on which it is dangerous for vessels to pass.

By night.—(i) All round *white* lights instead of the black balls, and an all round *red* light instead of the red flag, and displayed in a similar position.

(ii) Anchor light or lights as required by Article 11 of the International Regulations for Preventing Collisions at Sea.

It is the duty of any vessel, whether steam or sail, to give vessels engaged in dredging or boring operations a wide berth, and to reduce to dead slow speed when passing.

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CHAPTER XI

CHINA, SOUTH COAST—HONG KONG TO FOKAI POINT, BIAS BAY

Chart 3605.

COAST.—Off-lying islands and dangers.—Fat tau point (*Lat. 22° 16′ N., Long. 114° 18′ E.*) (page 476) is the south-eastern extremity of a peninsula extending from the mainland. A range of hills extends along the whole length of the peninsula, culminating in High Junk peak, 1,130 feet (344m4) high, situated about 2¼ miles north-north-westward of Fat tau point; the peak is remarkable when seen from south-eastward. Ma on shan, a range rising to an elevation of 2,284 feet (696m2), lies about 2 miles from the head of an extensive indentation between Fat tau point and a point about 8 miles north-eastward close off which is Fan chin chau, 165 feet (50m3) high. Rocky harbour (page 501) and Port Shelter (page 503) are situated between the islands lying in this indentation, and the Ninepin group and Victor rock (page 474) lie in its approach. Yi bluff, 434 feet (132m3) high, which is prominent with a bight on either side, lies half a mile north-eastward of Fat tau point.

Steep island, 330 feet (100m6) high, lies about half a mile north-eastward of Yi bluff. A rock, with a depth of 1½ fathoms (2m7) over it, lies 1¼ cables westward of Steep island.

Between a point, about 6 cables northward of Yi bluff, and a point about half a mile farther northward, there is a bight which is open to easterly winds and swell.

Trio islets, three in number, lie about 1½ miles northward of Steep island, and about 3 cables offshore. The highest of these islets has an elevation of 136 feet (41m4), with another islet, 84 feet (25m6) high, about half a cable south-westward; these two islets are almost connected by a reef on which there are some rocks, 8 feet (2m4) high. The north-westernmost of the Trio islets, 28 feet (8m5) high, with a rock, having a depth of less than 6 feet (1m8) over it, close north-westward, lies about 2 cables north-westward of the highest. Alexander rock, with a depth of 3 fathoms (5m5) over it, lies about a quarter of a mile north-eastward of the highest of the Trio islets.

From a point on the coast, abreast the Trio islets, some detached rocks above-water and reefs extend about half a mile northward.

Chart 3612.

Duck rocks, the northernmost of the last-mentioned reefs, with a rock, 8 feet (2m4) high, at their northern extremity, lie about 3 cables offshore; a detached 4¼-fathom (7m8) patch lies midway between Duck rocks and the coast.

Charts 1180, 3026, 1962, 2661a, 2661b, 1262.

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Chart 3612.

Table islet, 97 feet (29m6) high, lies in the approach to Port Shelter about half a mile east-north-eastward of the northern of the Duck rocks. There is a deep channel between the Trio and Table islets and the detached reefs lying offshore and terminating in Duck rocks.

Basalt island, 569 feet (173m4) high, lies about 2½ miles eastward of Table islet. The southern end of Basalt island is precipitous, and Steepcliff head, its southern extremity, is 307 feet (93m6) high. Hat rock, 89 feet (27m1) high, lies close westward of Steepcliff head, and several other rocks above water lie close off the south-eastern end of the island. Pyramid rock, 123 feet (37m5) high, with a rock, which dries 4 feet (1m2), close northward, lies close off the eastern part of the northern end of Basalt island. A bank, with depths of less than 5 fathoms (9m1) over it, extends nearly 2 cables from the north-western end of Basalt island.

For the eastern sides of the islands lying northward of Basalt island *see* page 505.

Bluff island, 504 feet (153m6) high, lies north-westward of Basalt island, separated by a channel about 3 cables wide; a rocky patch, with a depth of 4¾ fathoms (8m7) over it, lies near the middle of the north-eastern end of this channel. The southern end of Bluff island is precipitous. Collinson head, the southern extremity of the island, is 222 feet (67m7) high, and from it a spit, with a depth of 2¾ fathoms (5m0) over it, extends nearly half a cable southward.

Climate and weather.—*See* page 36.

Rocky harbour.—Dangers.—Rocky harbour, or Lung shun wan hoi, is entered from southward between Bluff island and Tiu chung chau, or Jin island, 702 feet (214m0) high, about one mile north-westward.

On the western side of the entrance, Peaked rock (*Lat. 22° 19′ N., Long. 114° 20′ E.*), consisting of two rocks close together, 44 feet (13m4) high, lies about 1½ cables southward of the southern end of Tiu chung chau, with foul ground, part of which dries 3 feet (0m9), between. Ma chai pai, a rock with a depth of 3¼ fathoms (5m9) over it, lies about 2 cables eastward of Peaked rock, and a rock, which dries 6 feet (1m8), lies nearly one cable north-north-westward of Ma chai pai.

Bay islet, 147 feet (44m8) high, lies about 1¼ cables off the eastern side of Tiu chung chau, connected by a ridge over which there are depths of less than 5 fathoms (9m1).

Ngai kap pai, a rocky patch, with a depth of 3 feet (0m9) over it, and a patch, with a depth of 2¾ fathoms (5m0) over it, close south-eastward, lies midway between Bay islet and the northern end of Bluff island. Pyramid rock, bearing 121°, and open north-eastward of Bluff island, leads north-eastward of Ngai kap pai, and also the 3-fathom (5m5) patch, which lies 1½ cables eastward of it (*see* page 502).

On the eastern side of Rocky harbour, Fu tau pun chau, or Town island, 227 feet (69m2) high, lies about a quarter of a mile north-eastward of Bluff island.

The channel between Fu tau pun chau and Basalt island is somewhat obstructed by Wei sam chau, a group of islets and rocks, the highest of which has an elevation of 94 feet (28m7). Wave rock, which dries 7 feet (2m1), lies in the same channel, about 3 cables west-north-westward of Wei sam chau, and near the southern end of a bank, with a depth of 3¾ fathoms (6m9) over its extremity, which extends 1¾ cables

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Chart 3612.

from the southern end of Fu tau pun chau ; there are tide-rips in this channel.

A bank, over which the depths are uneven and near the extremity of which there is a 3-fathom (5m5) patch, extends about three-quarters of a mile from the western side of Fu tau pun chau and almost as far as Ngai kap pai.

Lung shun wan chau or High island, the summit of which, 905 feet (275m8) high, is well defined, lies north-westward of Fu tau pun chau, separated by a very narrow channel, in the fairway of which there is a least depth of 19 feet (5m8). A bank, with depths of from 2¼ to 3 fathoms (4m1 to 5m5) over it, extends about 2 cables south-westward from the southern extremity of Lung shun wan chau.

Green islet, 50 feet (15m2) high, lies about half a mile north-north-westward of the southern extremity of Lung shun wan chau and close off the coast to which it is connected by a bank. Wok tuk pai, a rocky patch, with a least depth of 2¾ fathoms (5m0) over it, lies about 2½ cables westward of Green islet. Between Green islet and She wan tsui, half a mile north-westward, there is a bight in the south-western side of Lung shun wan chau with a shallow cove at its head ; on the shores of the cove there are some villages.

On the western side of Rocky harbour, Kau sai chau or Keui island, 707 feet (215m5) high, lies close northward of Tiu chung chau, connected by a bank which dries. Yat chap mo (*Lat. 22° 21′ N., Long. 114° 20′ E.*), 19 feet (5m8) high, lies about 6 cables north-north-eastward of the southern extremity of Kau sai chau, and about three-quarters of a cable off the coast to which it is connected by a reef. A rock, which dries 3 feet (0m9), lies about 3 cables northward of Yat chap mo, and close offshore.

On the eastern side of the harbour, between Datum point, situated about half a mile north-westward of She wan tsui, and a point about 2 cables farther northward, there is a bight with the village of Tai she wan on its north-eastern shore. Ki yan siak, the western extremity of Lung shun wan chau, lies about 7 cables north-westward of Datum point. Lung shun wan chau is separated from the mainland northward by a narrow channel, which dries from one to 3 feet (0m3 to 0m9) in places ; for the entrance to Kon mun, the south-eastern portion of this channel, *see* page 505.

Tai tau chau or Urn island, 207 feet (63m1) high, lies about 2 cables off the north-eastern side of Kau sai chau, with several islets and sunken rocks between, the positions of which can best be seen on the chart. Lo fu tiu pai, which dries 6 feet (1m8), lies near the south-eastern end of a shoal, with depths of from one to 2½ fathoms (1m8 to 4m6) over it, lying midway between the southern end of Tai tau chau and the coast of Kau sai chau south-westward.

Between the southern end of Tai tau chau and Ki yan siak, is the southern entrance of a channel, in the fairway of which there is a least depth of 19 feet (5m8), which leads into Port Shelter between Tai tau chau and Kau sai chau, on its southern side, and the mainland, on its northern side ; this channel is about one cable wide in its narrowest part, between the shore banks on either side.

Anchorage.—During the North-east monsoon, there is anchorage on the north-eastern side of Rocky harbour in the entrance to the cove about half a mile northward of Green islet, but the space is confined

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Chart 3612.

owing to sunken rocks. During the South-west monsoon, there is better shelter northward of Bay islet.

The bottom in these anchorages consists of mud.

Port Shelter.—Dangers.—Port Shelter, or Ngau mei hoi, which affords good anchorage to vessels of any size, is entered from south-eastward between Peaked rock (page 501) and Lung ha wan, on the mainland, about 1½ miles south-westward. For Table islet and Duck rocks, which lie on the south-western side of the approach to the port, *see* page 500.

Between Lung ha wan and Pa tau ko, about one mile north-westward, there is a bight, the head of which is shallow. A shoal, with a least depth of 2¾ fathoms (5m0) over it, lies 2 cables west-north-westward of Lung ha wan and about one cable offshore.

Shelter island, 416 feet (126m8) high, lies about 3½ cables north-eastward of Pa tau ko, the channel between being encumbered by a rocky shoal, over which there is a least depth of 3¾ fathoms (6m9). Nan pai, a rock, with a depth of 2¾ fathoms (5m0) over it, lies near the outer end of a bank, with depths of less than 5 fathoms (9m1) over it, which extends about 2 cables from the southern side of Shelter island. A rock, with a depth of less than 6 feet (1m8) over it, lies close eastward of Ngau tau, an islet, lying close off the south-eastern end of Shelter island. Ho pai, with a depth of 3 fathoms (5m5) over it, lies 3½ cables south-south-westward of Ngau miu, the northern extremity of Shelter island and 2 cables offshore. The south-western and western sides of Shelter island are fringed by a bank, with depths of less than 3 fathoms (5m5) over it, extending about 1½ cables offshore in places. A reef, which dries, extends about one cable northward from Ngau miu (*Lat. 22° 20′ N., Long. 114° 18′ E.*), and a bank, with depths of less than 5 fathoms (9m1) over it, extends about one cable westward and north-eastward from the outer end of the reef, and about three-quarters of a cable northward.

On the north-eastern side of the entrance to Port Shelter, Tiu chung, an islet, 25 feet (7m6) high, lies close off the south-western extremity of Tiu chung chau (page 501). Ngong wan pai, a rocky patch, with a depth of 5¾ fathoms (10m5) over it, lies in the channel between Shelter island and Tiu chung chau, about 3 cables from the south-western side of the latter. Kau sai wan is situated between the north-western end of Tiu chung chau and the southern side of Kau sai chau, its head being formed by the western side of the bank which connects the two islands. The village of Kau şai is situated on the northern side of the head of Kau sai wan.

Yi pai, a shoal consisting of rock and sand, lies near the centre of Port Shelter, midway between the northern extremity of Shelter island and Tai ngam tsui, the southern extremity of Kiu tsui chau, or Sharp island, about 1¼ miles northward. The depths over Yi pai vary from 1½ fathoms (2m7), near its southern end, to 5 fathoms (9m1).

Kiu tsui chau rises to a sharp summit, 447 feet (136m2) high. Between Kiu tsui chau and Kau sai chau there is a passage, from one to 3 cables wide, leading to the western end of the channel, northward of the latter island, which leads from Rocky harbour (*see* page 501). On the western side of this channel, Lung ngan yuen tau, an islet, 37 feet (11m3) high, lies nearly one cable north-eastward of Tai ngam tsui, and close offshore. Lak tui wan lies about 7 cables northward of Tai

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Chart 3612.

ngam tsui. A rock, 2 feet (0m6) high, lies near the extremity of a bank which extends about 1½ cables eastward from Lak tui wan. Northward of Lak tui wan, the eastern side of Kiu tsui chau is indented, and fringed by a shallow bank, which extends about 1½ cables offshore, on which are Tse leung chau, 88 feet (26m8) high, and Lam hum chau, 32 feet (9m8) high, both joined to the coast of that island by narrow reefs, which dry. Yum tin pai, a rock with a depth of 2½ fathoms (4m6) over it, lies nearly in mid-channel, about a quarter of a mile northward of Lak tui wan.

On the eastern side of the channel, in its northern portion, Yim tin tsai, in which there is a mission with a conspicuous church, is the largest of a number of islets and rocks which lie close off the north-western side of Kau sai chau; the positions of these islets and rocks can best be seen on the chart. A rock, 10 feet (3m0) high, lies on a reef close off the north-western end of Yim tin tsai; on the western extremity of this reef there is a rock, which dries 7 feet (2m1).

Cha yu pai, a rocky patch, over which there is a least depth of 1¾ fathoms (3m2), lies about 3 cables northward of the northern extremity of Kiu tsui chau.

On the south-western side of Port Shelter, between Pa tau ko (page 503) and Tang siak wan, about 2 miles north-westward, there is a bight, the shore of which is fringed by a bank, with depths of less than 3 fathoms (5m5) over it, extending as much as 2 cables offshore in places.

On the western side of Port Shelter, Pak sha wan hoi or Hebe haven, shallow in its northern part, is entered between Tang siak wan and Pak ma tsui, the southern extremity of a peninsula extending about 1¼ miles southward from the mainland, about 3 cables eastward. Pak ma tsui bank, with depths of less than 5 fathoms (9m1) over it, extends about 3 cables southward from Pak ma tsui; a rock, with a depth of 2½ fathoms (4m6) over it, lies near the southern end of this bank and about 2 cables from the point.

On the northern side of Port Shelter, Kiu tau, 95 feet (29m0) high, lies three-quarters of a mile north-westward of the southern extremity of Kiu tsui chau, connected to the south-western side of that island by a bank, which dries from 4 to 6 feet (1m2 to 1m8); rocks extend about one cable south-westward from Kiu tau (*Lat. 22° 22′ N., Long. 114° 17′ E.*), the outer rock being 2 feet (0m6) high.

Inner Port Shelter, or Sai kung hoi, is entered between the last-mentioned rock and Yi ngam tau, on the mainland, about 3½ cables south-westward. On the north-eastern side of Inner Port Shelter, Pak sha chau, 84 feet (25m6) high, lies about a quarter of a mile off the north-western side of Kiu tsui chau, on a shallow bank which connects the latter with the mainland north-westward; on this bank are a large number of other islets and rocks, both above-water and sunken, the positions of which can best be seen on the chart. There is no channel except for boats between the islets lying on the north-eastern side of Inner Port Shelter.

Sai kung, a village, is situated on the north-western side of Inner Port Shelter, on the northern side of a small inlet. On the southern side of this inlet, and prominent from the anchorage, there is a police station with white buildings, which is connected by telephone to Hong Kong.

Charts 3605, 1180, 3026, 1962, 2661a, 2661b.

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Chart 3612.

Anchorages.—Vessels can anchor in Port Shelter, in depths of from 8 to 9 fathoms (14m6 to 16m5), about 8½ cables north-westward of Ngau miu (page 503), the northern extremity of Shelter island; and in Inner Port Shelter, in depths of from 6 to 7 fathoms (11m0 to 12m8), about 3 cables south-westward of Pak sha chau.

Pak sha wan hoi is a snug anchorage for small vessels.

Vessels of moderate draught can proceed through the passage between Kiu tsui chau and Kau sui chau, and anchor northward of the former in a depth of 4 fathoms (7m3).

The bottom in the above-mentioned anchorages consists of mud.

Storm signals.—When local storm signals are displayed at Hong Kong, supplementary signals are displayed at Sai kung police station (*see* page 498).

Charts 3612, 3605.

Coast.—Dangers.—Wan chau kok (*Lat. 22° 20′ N., Long. 114° 23′ E.*), the eastern extremity of Hei lo to or Hole island, which is perforated, is situated about 1½ miles north-north-eastward of Steep-cliff head (page 501). Hei lo to is 309 feet (94m2) high, bare and precipitous; its north-western end is separated from the eastern side of Fu tau pun chau by a channel, about one cable wide, which is not navigable. Kung chau pai, an islet, 60 feet (18m3) high, with a rock, which dries 2 feet (0m6), about one cable south-eastward, lies about 4 cables north-north-eastward of the northern extremity of Hei lo to.

Wong nai chau, 71 feet (21m6) high, lies about 3 cables north-north-eastward of the north-eastern extremity of Fu tau pun chau, and in the approach to the channel between that island and Lung shun wan chau (page 502). North-westward of Wong nai chau there is a shallow bight in the south-eastern side of Lung shun wan chau. Poh pin chau, 155 feet (47m2) high and cliffy, lies close off the eastern extremity of Lung shun wan chau and about one mile north-eastward of Wong nai chau.

Kon mun, entered between Poh pin chau and a point on the mainland, about a quarter of a mile northward, is the south-eastern end of the shallow channel mentioned on page 502.

Chart 3605.

Long kair wan, the bottom of which consists of sand, is entered between the northern entrance point of Kon mun and Fan chin chau (page 500); there is a sandy beach at the head of this bay, where the village of Long kair is situated, but landing is often difficult owing to the swell.

Kung kei tsui, with a small inlet close westward, lies three-quarters of a mile northward of Fan chin chau. Boole rock, with a depth of 4 fathoms (7m3) over it, lies 1½ cables north-eastward of Kung kei tsui, and about the same distance offshore. Tai yu ngaam lies about 6½ cables northward of Kung kei tsui, and two rocks, close together, and 55 feet (16m8) high, lie close offshore midway between. Tai yu ngaam teng, 753 feet (229m5) high, and prominent from south-eastward, lies about a quarter of a mile south-westward of Tai yu ngaam, and a short distance inland.

Storm signals.—When local storm signals are displayed in Hong Kong, supplementary signals are displayed at Tai yu ngaam teng police station (*see* page 498).

Tai long wan.—Aspect.—Tai long wan or Fung bay is entered

Charts 1180, 3026, 1962, 2661a, 2661b.

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Chart 3605.

between Tai yu ngaam and Tai long tsui, or Fung head, about 1¾ miles north-north-eastward. In the vicinity of Tai long wan, Tai yu shan, 1,030 feet (313m9) high, situated three-quarters of a mile westward of Tai yu ngaam, and Tai mun shan, 1,201 feet (366m1) high, situated about 2¼ miles westward of Tai long tsui, are prominent.

Tai long wan is open eastward and a heavy swell sets in except during the summer months. Chim chau, a group of three islets, 158, 132, and 31 feet (48m1, 40m2, and 9m4) high, respectively, lies near the middle of the bay, about half a mile offshore. A patch, with a depth of 3¾ fathoms (6m9) over it, lies close westward of the southernmost islet, and a patch, which dries 6 feet (1m8), lies close westward of the northernmost and smallest islet. Mong yu kok, a small projection, divides the head of the bay into two portions; foul ground extends about 1½ cables from the shore of the northern portion. In the southern portion, about half a mile southward of Mong yu kok, there is a sandy inlet, with the village of Sai wan at its head, where landing can be effected. The village of Ham tin stands close westward of Mong yu kok.

A large number of fishing stakes, awash, were reported by H.M.S. *Sandwich*, in 1935, to exist in the southern approach to Mirs bay, from 1½ to 2½ miles off the entrance to Tai long wan.

Chart 3474.

Tai long tsui (*Lat. 22° 25′ N., Long. 114° 24′ E.*) is 341 feet (103m9) high, rocky and steep-to, with several rocks, from 3 to 50 feet (0m9 to 15m2) high, lying close off it.

MIRS BAY.—Mirs bay is entered between Tai long tsui and Chun pei ngaam, or Mirs point, about 5¾ miles east-north-eastward. There is secure anchorage in this bay during a typhoon, there being many well-sheltered anchorages available for all classes of vessels. Long harbour is considered the best; Tolo harbour is also good, and fairly good shelter may be obtained under Peng chau when the wind is southerly.

The land in the vicinity of Mirs bay is high. Ma on shan (page 500) and Nam she tsim, or Sharp peak, 1,525 feet (464m8) high, situated about 2 miles north-westward of Tai long tsui, are prominent. Wu tung shan, 3,095 feet (943m4) high, situated at the north-western end of the bay, about 2 miles inland and Meisha Chien, 2,472 feet (753m5) high, 3¾ miles north-eastward of Wu tung shan, are also prominent.

Coast.—Islets and dangers.—Beacons.—On the south-western side of Mirs bay, Tan tsui, or Bate head, lies about 1½ miles northward of Tai long tsui. A rock, 69 feet (21m0) high, with another rock, 37 feet (11m3) high, about one cable southward, lies close off Tan tsui.

Gau tau or Shek ngau chau, rocky and 86 feet (26m2) high, lies almost in the middle of the fairway, about 2¼ miles north-eastward of Tan tsui. Breaker reef, the centre portion of which dries 5 feet (1m5) and on which the sea generally breaks, lies half a mile south-westward of Gau tau. There is a rock, awash, on the north-western end of Breaker reef, and a 4½-fathom (8m2) patch on its south-eastern end, about 1½ cables from the centre portion. South Gau or Wong mau chau, 60 feet (18m3) high, and surrounded by foul ground which extends for about 2 cables from its western side, lies about three-quarters of a mile north-north-westward of Tan tsui.

Charts 3026, 1962, 2661a, 2661b.

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Charts 3386, 3474.

Between a point, close off which there are two rocks, each 30 feet (9^{m}1) high, situated about 6 cables west-north-westward of Tan tsui, and a point about 1½ miles farther west-north-westward, there is a bay. A rocky bank, with depths of less than 5 fathoms (9^{m}1) over it, extends as much as 3½ cables in places from the southern shore of this bay, and a patch, with a depth of 2¼ fathoms (4^{m}1) over it, lies in the north-western approach, about half a mile north-north-eastward of its western entrance point, and 1¾ cables offshore. There is anchorage in the bay, during southerly winds, off Nam she, a village, situated at its head, in a depth of 8 fathoms (14^{m}6), or closer in according to draught.

Boulder point (*Lat. 22° 28′ N., Long. 114° 22′ E.*), the northern extremity of a peninsula which rises to an elevation of 413 feet (125^{m}9), lies about 1½ miles north-north-westward of Nam she village.

Kau lau wan hoi, or South channel, leading into Long harbour (page 509), lies between Boulder point and the southern end of Tap mun chau or Grass island, about a quarter of a mile northward. Kau lau wan hoi, in the fairway of which there is a depth of 3¼ fathoms (5^{m}9), is barely half a cable wide between the shoals extending from both sides and there is a rock, which dries one foot (0^{m}3), situated on the northern side of the channel, nearly one cable offshore.

Wintz hill, 401 feet (122^{m}2) high, the summit of Tap mun chau, is situated about one mile from the southern end of the island.

Kong chau, a group of islets and rocks, the highest of which has an elevation of 111 feet (33^{m}8) and is steep and black, lies about 3 cables eastward of the north-eastern end of Tap mun chau, on the north-eastern end of a reef which extends about half a mile north-eastward from the eastern side of that island; some of the rocks on this reef dry, and there is no navigable passage over it.

A spit, with a depth of 1¾ fathoms (3^{m}2) at its outer end, extends nearly half a cable south-eastward from Kong chau.

Waterwitch rock, with a depth of 1¾ fathoms (3^{m}2) over it, lies about a quarter of a mile south-eastward of Kong chau. Tan tsui, bearing 160°, and open north-eastward of South Gau, leads north-eastward of Waterwitch rock. Wong chuk kok tsui in line with the southern extremity of Chik chau, bearing 304°, leads 2 cables north-eastward of Waterwitch rock, and close north-eastward of Cha am pai.

Fishing stakes and nets, close together, extend eastward from the southern end of Tap mun chau as far as Gau tau (page 506).

Chik chau or Port island, 422 feet (128^{m}6) high, lies 6 cables northward of Tap mun chau, being separated by Chik chau hau or Middle channel, with a least depth of 11 fathoms (20^{m}1) in the fairway. A narrow ledge, with rocky pinnacles on it, extends 1¼ cables from the north-eastern extremity of Chik chau.

Cha am pai, or Channel rock, awash at high water, and on which the sea usually breaks, lies on the southern side of Chik chau hau, about 3 cables north-north-eastward of the north-eastern extremity of Tap mun chau. The 314-foot (95^{m}7) high peak, on the northern end of Pak sha tau chau (page 511), in line with a large boulder on Heung lo po, bearing 252°, leads through Chik chau hau between Chik chau and Cha am pai.

Chik chau is separated from Wong chuk kok tsui, or Bluff head, west-north-westward, by Tai chik mun or North channel, nearly

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Charts 3386, 3474.

1¼ miles wide; this channel leads into Tolo harbour through Tolo channel, which are described on pages 512 and 511, respectively.

Chart 3474.

On the north-eastern side of Mirs bay, Chun pei ngaam or Mirs point (page 506) rises to an elevation of 1,284 feet (391m4); there is a boundary beacon about a quarter of a mile north-westward of the point. Griffin rock, 50 feet (15m2) high, lies close off the point.

Between a point, about half a mile north-westward of Chun pei ngaam, and Hakngam kok, about one mile farther north-westward, there is a bay which affords shelter to small vessels with winds from north to east. Near the head of the bay there is a joss house with a prominent white boulder close eastward of it. When approaching the anchorage in this bay, the beacon north-westward of Chun pei ngaam becomes hidden by high land.

Between Hakngam kok (*Lat. 22° 28′ N., Long. 114° 29′ E.*) and the southern entrance point of a small bay, about 3¾ miles northward, the coast is slightly indented, and several rocks, which dry from one to 5 feet (0m3 to 1m5), lie close offshore. There is a Custom-house at the head of the small bay, and the village of Nan oa is situated at the southern end of the bay. A rock, 15 feet (4m6) high, lies about half a cable offshore, abreast Nan oa, and 4 cables westward of this rock, there is another rock, 50 feet (15m2) high, which lies near the outer edge of the coastal bank. A shoal, with a depth of 4¼ fathoms (7m8) over it, at its southern end, lies about 4 cables westward of the 50-foot (15m2) high rock.

Between a point, about 4 cables northward of the last-mentioned rock, and a point which rises steeply to East cone, about three-quarters of a mile north-westward, there is a bay, with depths of less than 5 fathoms (9m1), on the northern side of which is a village. The head of the bay is connected to Tai pang wan (page 523) by a low isthmus.

East cone is a remarkable peak, 745 feet (227m1) high; between the point at the end of its southern slope and Nam au tsui, or Albion point, about 2 miles north-westward, there is a bight, the shores of which are fringed by a narrow bank with depths of less than 3 fathoms (5m5) over it. A peaked rock, 40 feet (12m2) high, lies on the edge of this bank, about 6 cables west-north-westward of East cone. The village of Tai o is situated at the head of this bight.

Peng chau, 138 feet (42m1) high, on its southern side, lies about one mile south-south-westward of Nam au tsui. The north-western and southern sides of the island are cliffy, and fringed by a reef extending about one cable offshore. A bank, with depths of less than 5 fathoms (9m1) over it, extends about 2 cables from the southern side, and there is a detached patch, with a depth of 4 fathoms (7m3) over it, close southward of this bank. A bank, with depths of less than 3 fathoms (5m5) over it, extends 1½ cables from the eastern side of the island, and as much as 3 cables with depths of 5 fathoms (9m1). A rock, awash, lies about one cable northward of the eastern extremity of the island.

The geological formation of Peng chau differs from that of the adjacent land, being alluvial, and its beaches are of shale stones.

Peng chau hoi, between Peng chau and the mainland north-eastward, affords good anchorage during the North-east monsoon, in a depth of 7 fathoms (12m8), but it is much obstructed by fishing stakes.

Between Nam au tsui and a point, 5¾ miles west-north-westward,

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Chart 3474.

there is a bay, on the eastern side of which there is a flagstaff standing close to a large building, about three-quarters of a mile northward of Nam au tsui. Sha yu yung, a village in which there is a prominent Custom-house, is situated at the head of the bay, about 3 miles north-westward of Nam au tsui. A flagstaff stands at the head of a small inlet, near the village of Ch'i yung, about 1½ miles north-eastward of the western entrance point of the bay.

Between the last-mentioned point and a prominent point, which is steep-to, about 2 miles west-south-westward, there are two bights, divided from one another by a projection; Peak rock, 63 feet (19m2) high, surrounded by sunken rocks, some of which dry, lies in the approach to the western bight, about 3 cables south-westward of the projection which divides them.

Starling inlet (page 516) is approached between the prominent point, mentioned above, and Chek kok tau, or North point (*Lat. 22° 33′ N., Long. 114° 17′ E.*), the north-western extremity of Kat o chau, about 1¾ miles south-south-westward.

Chart 3544.

Young Hebe shoal, with a least depth of 3 fathoms (5m5) over it, lies near the eastern edge of a bank, over which there are depths of less than 5 fathoms (9m1), in the approaches to Starling inlet and Crooked harbour from eastward, in a position about 9 cables northward of Chek kok tau.

On the western side of Mirs bay, Wong chuk kok tsui (page 507) is the north-eastern extremity of a hilly peninsula, on which the peaks are from about 500 to 950 feet (152m4 to 289m6) high. There is a beacon in ruins near the extremity of Wong chuk kok tsui, and another beacon, near the summit of a peak, 661 feet (201m5) high, about one mile south-westward.

Wan chuk kok hoi (page 513) is entered between Wong chuk kok tsui and Mit kok tsui, the eastern extremity of Wong wan chau, or Double island, about three-quarters of a mile west-north-westward.

Chik mun (page 514), which leads into Double haven, is entered from south-eastward between Mit kok tsui and the southern extremity of Ngo mei chau, or Crescent island, about 4 cables northward; the latter is 471 feet (143m6) high, and Crescent cove is situated on its northern side. Several rocks, from 4 to 16 feet (1m2 to 4m9) high, lie on a bank which extends about one cable from the western side of the head of Crescent cove.

Pak sha chau, or Round island, 203 feet (61m9) high, lies about half a mile north-eastward of the north-eastern extremity of Ngo mei chau.

Double haven is approached from north-eastward between Pak sha chau and Kai kung tau or Peaked head, the north-eastern extremity of Kat o chau, or Crooked island, about 8½ cables north-westward.

Cock's head rock, with a depth of 3¾ fathoms (6m9) over it, lies about 3¼ cables eastward of Kai kung tau.

Chek kok tau or North point, the northern extremity of Kat o chau, lies about 1½ miles west-north-westward of Kai kung tau.

Chart 3386.

Long harbour and approaches.—Dangers.—Long harbour, or Chik king hoi, can be approached through Kau lau wan hoi, Chik chau hau, or Tai chik mun; its principal entrance lies between the western

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Chart 3386.

extremity of Tap mun chau (page 507) and Koon tsoi kok or Ocean point, the northern extremity of Titau peninsula, 6½ cables westward; Goliath hill, the summit of the peninsula, is 506 feet (154m2) high.

At its southern end, Long harbour is divided into two narrow arms, named East arm and West arm, by Stokes point, from which a bank, with depths of less than 3 fathoms (5m5) over it, extends nearly one cable northward; the heads of these arms have depths of less than 3 fathoms (5m5) extending out about 2 cables.

Ma peng, or Le Mottée shoal, with a depth of 2 fathoms (3m7) over its western edge, which is steep-to, lies on the eastern side of Long harbour, about 2 cables southward of the western extremity of Tap mun chau, and on the end of a spit, with depths of less than 5 fathoms (9m1) over it, extending about 1¾ cables offshore.

Ma yin, or Junk rock, with a depth of 4 feet (1m2) over it, lies 6½ cables south-south-eastward of the western extremity of Tap mun chau, near the south-western end of a spit, with depths of less than 5 fathoms (9m1) over it, which extends about 1½ cables offshore.

Phillimore rock, with a depth of 4½ fathoms (8m2) over it, lies on the western side of Long harbour, about half a mile south-eastward of Koon tsoi kok (*Lat. 22° 29′ N., Long. 114° 20′ E.*), and one cable offshore.

Warburg rock, with a depth of 4¾ fathoms (8m7) over it, lies in the fairway, about 9 cables southward of the western extremity of Tap mun chau. The western extremities of Chik chau and Tap mun chau in line, bearing 005°, lead less than one cable westward of Warburg rock.

The village of Tap mun stands at the head of an indentation on the south-western side of Tap mun chau.

White cove lies in the north-western portion of Long harbour and is entered between the southern extremity of Titau peninsula, about one mile southward of Koon tsoi kok, and a point about 3 cables west-south-westward. A shoal, with a least depth of 2½ fathoms (4m6) over it, lies about one cable off the western entrance point of the cove.

Anchorage.—Long harbour affords good anchorage, in depths of from 5 to 8 fathoms (9m1 to 14m6), but, during northerly winds, it is open to a considerable northerly swell.

Hoi ha.—Hoi ha, or Jones cove, is the eastern of two bays entered between Koon tsoi kok and Heung lo po, about one mile westward. The two bays are divided by a projection from which a shallow spit, on which are several islets and rocks, extends about 6 cables northward; Chu ma pai, 2 feet (0m6) high, with a rock, which dries 7 feet (2m1), close south-westward, is the outermost of these rocks, and lies 5½ cables north-westward of Koon tsoi kok. Fung chau, 60 feet (18m3) high, the easternmost of the islets on the spit, lies 3¾ cables westward of Koon tsoi kok, and Pin chau, or Flat island, 95 feet (29m0) high, the largest, lies close westward of Fung chau. There is a rock, 27 feet (8m2) high, close off the south-western side of Pin chau, and an islet, 80 feet (24m4) high, lies between the latter and the mainland.

Datum rock, which dries 7 feet (2m1), lies on the eastern side of the entrance to Hoi ha, about 3¼ cables south-south-westward of Koon tsoi kok, and close offshore. Between Datum rock and Flynn point, half a mile southward, there is a bight. A rock, which dries 3 feet (0m9), lies about three-quarters of a cable west-south-westward of

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Chart 3386.

Flynn point, with depths of less than 3 fathoms (5m5) extending a short distance farther westward.

On the western side of Hoi ha, Tide pole point lies about 4 cables south-westward of Datum rock.

The village of Hoi ha stands at the head of Hoi ha, which partly dries.

During northerly winds, Hoi ha is open to a considerable swell.

Poultry, eggs and fish may be obtained in limited quantities from the villages in Long harbour.

Charts 3386, 3329.

Tolo channel and approaches.—Dangers.—Tolo channel, or Chik mun hoi hap, is situated on the south-western side of Mirs bay and can be approached through either Chik chau hau or Tai chik mun (page 507); it is entered from north-eastward between Heung lo po and Wong chuk kok tsui (page 507), about 2 miles north-north-eastward.

The north-western side of the channel is formed by two peninsulas, the north-eastern of which terminates in Wong chuk kok tsui, and the south-western in a point about 5 miles south-westward of Wong chuk kok tsui. There are two small indentations on this side, one about 2 miles south-westward of Wong chuk kok tsui and the other about 2 miles farther south-westward.

Chart 3329.

Pak sha tau chau, or Harbour island (*Lat. 22° 28′ N., Long. 114° 15′ E.*) lies about 2 cables south-westward of the extremity of the south-western peninsula, with an islet between; this island has several peaks, the highest of which has an elevation of 345 feet (105m2), and the northernmost, 314 feet (95m7).

On the south-eastern side of the channel, between a point about 1½ miles south-westward of Heung lo po, and a point about one mile farther south-westward, there are two bays, divided from one another by a projection, off which a spit, with depths of less than 3 fathoms (5m5) over it, extends over half a cable.

Knob reef, with rocks from 4 to 15 feet (1m2 to 4m6) high on its western side, lies 2 miles south-westward of Heung lo po and 3 cables northward of the projection which divides the two bays on the south-eastern side of Tolo channel, previously mentioned.

Flat reef, which dries from 5 to 6 feet (1m5 to 1m8) and has a rock, 3 feet (0m9) high, on it, lies about 3 cables south-westward of Knob reef, with uneven depths between.

Bush reef, or Miau, 2 feet (0m6) high, lies in mid-channel, about 3½ cables south-eastward of Pak sha tau chau.

Although there is a channel on either side of these reefs, the north-western, being the wider, is preferable.

A 3-fathom (5m5) patch lies about 1½ cables eastward of the southern extremity of Harbour island.

Kei ling ha hoi, or Three-fathoms cove, on the south-eastern side of Tolo channel, is entered between a point situated about three-quarters of a mile south-westward of the south-western entrance point of the two bays mentioned above and a point about three-quarters of a mile farther south-westward. On the western side of Kei ling ha hoi there are two islets, lying about one cable off the coast, with which they are connected by foul ground. Sigan, the outer, is 29 feet (8m8) high, and

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Chart 3329.

the other, about 3½ cables southward, is 130 feet (39m6) high. The south-eastern side and also the head of the cove are shallow.

Between the south-western entrance point of Kei ling ha hoi and a point about three-quarters of a mile westward, the coast is fringed by a drying bank of mud and stones, and depths of less than 3 fathoms (5m5) extend about 3 cables offshore.

At its south-western end, between the south-western extremity of Pak sha tau chau and U kwai sha tsui or White head, a peninsula, 307 feet (93m6) high, about three-quarters of a mile south-south-westward, Tolo channel leads into Tolo harbour or Tai po hoi.

Tolo harbour.—Dangers.—Ah chau or Centre island, 80 feet (24m4) high, lies in the fairway of the western end of the harbour, about 8 cables westward of the western extremity of U kwai sha tsui (*Lat. 22° 26′ N., Long. 114° 14′ E.*). Sha tin hoi, or Tide cove (*see* below), is situated on the southern side of Tolo harbour and is entered between the western extremity of U kwai sha tsui and a point about 1½ miles south-westward. In 1936, the eastern side of the entrance to Sha tin hoi was reported to be obstructed by fishing stakes.

Plover cove, or Shun wan hoi (page 513), is situated on the north-eastern side of Tolo harbour, and is entered between Pak sha tau chau and Ma sze chau, an island, 373 feet (113m7) high, about three-quarters of a mile westward. Close westward of Ma sze chau, and connected with it by foul ground, there is another island which lies close off the mainland, to which it is connected by a drying bank.

At the western end of Tolo harbour, the depths gradually decrease and, at its head, there is a drying bank, which extends nearly one mile.

Tai po, a settlement in which there is a police station and other buildings, stands on the southern side of the head of Tolo harbour.

Island house, a conspicuous red and white house, with a flagstaff near it, stands on a small island, about 90 feet (27m4) high, 4 cables eastward of the police station ; a pier, on the head of which there is a flagstaff, extends southward from the south-eastern part of the island. The island is connected to the mainland by causeways. A rock, with a depth of less than 6 feet (1m8) over it, lies about 1¾ cables eastward of the island.

Tai po railway station is situated on the coast, 3 cables south-eastward of the last-mentioned island, and a stone pier, about one cable long, with a mooring buoy close off its outer end, extends from the coast close eastward of the railway station ; depths of from 12 to 6 feet (3m7 to 1m8) lie in the northern approach to the pier, and there is a depth of 9 feet (2m7) at the head of the pier.

A small bay, which dries, and is crossed by a prominent railway bridge, is situated about 3 cables eastward of the railway station. A prominent white house stands on the promontory forming the eastern side of this bay.

On the northern side of the head of the harbour, on the western side of a small promontory situated about 1¼ miles north-eastward of Island house, there is a pier, with a depth of about one foot (0m3) at its head ; a prominent boat-shed stands near the root of this pier.

Sha tin hoi.—Danger.—The depths decrease gradually towards the head of Sha tin hoi, except for a rock, which dries 4 feet (1m2), situated nearly 2 miles south-westward of the western extremity of U kwai sha tsui and abreast a waterfall on the western side of the cove.

Charts 3474, 3605, 3026, 1962, 2661a, 2661b.

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Chart 3605.

There is a police station, situated on the northern end of a peninsula, at the head of Sha tin hoi.

Chart 3329.

Plover cove.—Dangers.—On the western side of Plover cove, between the northern extremity of Ma sze chau and a point about half a mile northward, there is a bight, off the northern and western shores of which are mud flats, which dry; Yeung chau lies in the middle of this bight, about half a mile west-north-westward of its southern entrance point. On the north-western side of the cove, between the northern entrance point of the bight and the southern extremity of a small projection, about 1¾ miles north-eastward, there is another bight, at the head of which a small stream flows through a drying bank of sand, mud, and stones; Chung pui, a village in which there are some jetties, is situated on the western bank of the stream.

A rock, 9 feet (2m7) high, with another rock, 8 feet (2m4) high, close eastward, lies about 3 cables off the western side of this bight, and about 1¼ miles north-north-eastward of the northern extremity of Ma sze chau (*Lat. 22° 27′ N., Long. 114° 14′ E.*). A rock, with a depth of 1½ fathoms (2m7) over it, lies about 2 cables south-south-westward of the 9-foot (2m7) high rock. A patch, which dries 4 feet (1m2), lies close off the eastern entrance point of the bight. At the head of Plover cove there is a peninsula; a rocky patch, which dries from one to 5 feet (0m3 to 1m5), lies about 1½ cables off the south-western end of this peninsula. In 1936, Plover cove was reported to be somewhat obstructed by fishing stakes.

Anchorages.—There is anchorage in Sha tin hoi, protected from all winds, in depths of from 3 to 4 fathoms (5m5 to 7m3).

Plover cove affords very good anchorage.

Dangerous goods anchorage.—The anchorage for vessels with dangerous goods is bounded by imaginary lines drawn in a 000° and 180° direction through Bush reef and a 353° and 173° direction through the eastern extremity of Ma sze chau.

Storm signals.—When local storm signals are displayed at Hong Kong, supplementary signals are displayed on the flagstaff near Island house at Tai po (*see* page 498).

Chart 3544.

Double haven and approaches.—Double haven, or Tai chau to hoi, the bottom of which consists of mud, is one of the best anchorages in Mirs bay, and is completely landlocked. The haven can be entered from south-eastward by Kang mun, a narrow boat passage at the western end of Wan chuk kok hoi, between the mainland and Wong wan chau (page 509); from eastward by Chik mun, between Wong wan chau and Ngo mei chau; from north-eastward, by Siu mun or Deep pass, between the latter and Kat o chau; and from north-westward, through Crooked harbour (page 514). The shores of Double haven are much indented and there are several islets and dangers within.

Wan chuk kok hoi.—For the entrance to Wan chuk kok hoi *see* page 509. On the north-western side of Wan chuk kok hoi, Wong wan is entered between Wong wan tsui, situated about 8 cables south-westward of Mit kok tsui and Chak u pai, about 4½ cables farther south-westward. Chak u pai is a reef, which dries 6 feet (1m8), extending about half a cable offshore, and with depths of less than 5 fathoms (9m1) extending about half a cable farther offshore.

Charts 3474, 3605, 3026, 1962, 2661a, 2661b.

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Chart 3544.

On the south-eastern side of Wan chuk kok hoi, U pai, a rock, 2 feet (0m6) high, lies about a quarter of a mile south-eastward of Wong wan tsui and is connected to the coast about three-quarters of a cable south-eastward, by a bank, with depths of less than 3 fathoms (5m5) over it. U chau tsai, an islet, 96 feet (29m3) high, lies in the entrance to a small shallow cove, about half a mile west-south-westward of U pai and close offshore.

At its head, Wan chuk kok hoi leads into Double haven through Kang mun.

For anchorage in Wan chuk kok hoi, *see* page 516.

Chik mun.—The south-eastern entrance of Chik mun is described on page 509. There is a least depth of 3½ fathoms (6m4) in the fairway of this channel, which is very narrow, just eastward of Ki lun shek, a peaked rock, 22 feet (6m7) high, situated on the south-western side of the channel, about 6¼ cables north-westward of Mit kok tsui (*Lat. 22° 31′ N., Long. 114° 19′ E.*). At its north-western end, Chik mun leads into Double haven.

Siu mun and approaches.—Siu mun, leading into the north-eastern end of Double haven, is a little over one cable wide between the banks which fringe the shores on either side; the pass is deep and clear of danger. Pak sha chau (page 509) and Cock's head rock lie in the approach to Siu mun from eastward.

On the north-western side of the approach to Siu mun, Au pui tong, an indentation in the south-eastern side of Kat o chau, is entered between Kai kung tau and the north-western entrance point of Siu mun, about one mile south-westward. Tui min chau, 358 feet (109m1) high, lies close off the last-mentioned point, connected to it by a bank, with depths of less than 3 fathoms (5m5) over it. A reef, which dries 6 feet (1m8) and at the extremity of which is Wong nai chau, 67 feet (20m4) high, extends about 1½ cables north-eastward from Tui min chau. A spit, with a depth of 2 fathoms (3m7) at its outer end, extends about one cable south-south-eastward from Wong nai chau.

Crooked harbour.—Islets and dangers.—Crooked harbour, or Sham chung wan, which affords good anchorage, is entered between Chek kok tau or North point, and Sam kau pui kok, a small peninsula, 111 feet (33m8) high, on the mainland, about 1¾ miles west-south-westward. The eastern shore of Crooked harbour is free from danger, and is indented by Kat o wan and another bay, southward, which are divided from one another by O shi kok, about half a mile south-south-westward of Chek kok tau. The villages of Tung O and Sai O are situated at the head of Kat o wan.

Pak sha tau tsui, or Sandy point, the south-western extremity of Kat o chau, is situated about 8½ cables southward of O shi kok.

On the western side of the entrance to Crooked harbour, a bank, with depths of less than 3 fathoms (5m5) over it, lies from one cable northward to 7 cables north-eastward of Sam kau pui kok. Sai ap chau, 45 feet (13m7) high, lies on the western end of this bank, and Ap chau or Robinson island, 86 feet (26m2) high, near the south-eastern end of the bank, with Hop lo chau, 17 feet (5m2) high, midway between. A reef, which dries 6 feet (1m8), extends about half a cable south-westward from the southern extremity of Ap chau, and a detached 3-fathom (5m5) patch lies about three-quarters of a cable southward of the extremity of the reef. A rock, which dries 5 feet

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Chart 3544.

(1m5), lies about 1½ cables west-north-westward of the southern extremity of Ap chau, on the southern end of a detached shoal.

A shoal, with a rock 2 feet (0m6) high, on its western end and Lo chi pai, one foot (0m3) high, on its eastern end, lies about three-quarters of a cable eastward of Sam kau pui kok. Cheung shek tsui, an islet, 157 feet (47m8) high, lies about three-quarters of a cable south-south-eastward of Sam kau pui kok, and is connected to the mainland by a narrow, drying bank.

The south-western side of Crooked harbour is indented, and several islets, all surrounded by reef, lie off the projecting points. Tai lin chau (*Lat. 22° 33′ N., Long. 114° 16′ E.*), 82 feet (25m0) high, lies a quarter of a mile south-eastward of Cheung shek tsui, and 1¾ cables offshore. Mui tau chau lies about 2 cables south-south-eastward of Tai lin chau, and about three-quarters of a cable northward of Pak kok, a point on the mainland to which it is connected by a bank, on which there are some rocks, which dry 2 feet (0m6). Shau kei pai, Fan chau, 132 feet (40m2) high, and Tsing chau or Table island, 50 feet (15m2) high, lie about 3, 4½ and 7½ cables, respectively, south-eastward of Mui tau chau. Tsing chau is about 2 cables northward of Liu ko ngam, a point situated about 1¾ miles south-eastward of Sam kau pui kok. Yan chau, 59 feet (18m0) high, lies about 1¼ cables westward of Fan chau, and Mun tau pai, a rock which dries 8 feet (2m4), lies about one cable southward of Yan chau, and three-quarters of a cable offshore.

For anchorage in Crooked harbour, *see* page 516.

Tsing chau lek.—Dangers.—The south-eastern end of Crooked harbour is connected with Double haven by Tsing chau lek, a channel about 3½ cables wide, between Liu ko ngam and Pak sha tau tsui, north-eastward. On the south-western side of this channel, Fung yung wan is entered between Liu ko ngam and Sz ngam tau kong, about 3 cables south-eastward; Luk tsz tun, an islet, 9 feet (2m7) high, lies close north-westward of the south-eastern entrance point of this bay. Yuen tsz chau, 34 feet (10m4) high and fringed by a reef, lies about one cable north-eastward of Sz ngam tau kong. A patch, on which there are some rocks, which dry from 3 to 7 feet (0m9 to 2m1), lies close southward of Yuen tsz chau, and about half a cable from the edge of the coastal reef which extends eastward from Sz ngam tau kong.

On the north-eastern side of Tsing chau lek, Pak sha tau tsui is foul to the distance of about one cable. Village rock, which dries 6 feet (1m8), lies about 3½ cables east-south-eastward of Pak sha tau tsui, and at the southern end of a reef which extends about 2¼ cables south-south-westward.

Islets and dangers in Double haven.—Fu yung chau, 125 feet (38m1) high and fringed by a reef, lies on the western side of Double haven, about 3 cables southward of Yuen tsz chau, and is connected to the shore by a shallow bank about one cable wide. Fu yung chau tau, on which there is a rock which dries 4 feet (1m2), lies near the extremity of a bank, with depths of less than 5 fathoms (9m1) over it, extending about 2 cables south-eastward from Fu yung chau.

Middle ground, with a rock having a depth of 6 feet (1m8) over it, near its western end, lies about 2 cables north-eastward of Fu yung chau.

On the south-eastern side of Double haven, Horley rock, with a

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Chart 3544.

depth of 5 feet (1m5) over it, lies about 9 cables eastward of Fu yung chau, and 1¼ cables offshore.

Snake islet, 40 feet (12m2) high, lies 7 cables east-south-eastward of Fu yung chau, connected to the shore by a shallow bank, less than one cable wide; a bank, with depths of less than 5 fathoms (9m1) over it, extends 1½ cables north-north-westward from Snake islet, with Woodman reef, over which there is a least depth of 2 feet (0m6) near its extremity, and a detached 3½-fathom (6m4) patch, close north-eastward of the same extremity.

Yat tsz tsui (*Lat. 22° 31′ N., Long. 114° 18′ E.*), a rock, 20 feet (6m1) high, lies a short distance within the extremity of a reef which extends one cable northward from a small peninsula, 30 feet (9m1) high, forming the north-western extremity of Wong wan chau, situated about 3 cables westward of Snake islet.

Kang mun (page 513) is approached from north-westward between Yat tsz tsui and Kung pai, a rock, 12 feet (3m7) high, about 3 cables south-westward. Kung pai lies on a bank, with depths of less than 3 fathoms (5m5) over it, which extends about one cable offshore.

Anchorages.—There is good anchorage in Wan chuk kok hoi (page 513), in depths of from 6 to 8 fathoms (11m0 to 14m6), mud.

There is good anchorage in Crooked harbour, in depths of from 6 to 7 fathoms (11m0 to 12m8), mud.

There is very good anchorage in Double haven, in a depth of about 7 fathoms (12m8), mud.

Charts 3544, 3474.

Starling inlet and approaches.—For the approach to Starling inlet, *see* page 509. Midway between Young Hebe shoal and Sha kang hau, a town in which there is a Custom house, situated on the north-western side of the approach, about 2 miles north-westward of Chek kok tau, there are three detached 3-fathom (5m5) patches near the edge of the bank, over which there are depths of less than 5 fathoms (9m1), and which extends about 6 cables offshore.

Chart 3544.

For Crooked harbour, which lies on the southern side of the approach to Starling inlet, *see* page 514.

Starling inlet or Sha tau kok hoi is entered between Cheung pai tau, situated about a quarter of a mile westward of Sam kau pui kok (page 514) and a point about 1¼ miles north-westward; the depths gradually decrease towards its head, which is shallow.

Between Cheung pai tau and a point about 7 cables westward, the southern side of the entrance to Starling inlet is indented. Ah kung tsui, an islet, 52 feet (15m8) high, lies close off the last-mentioned point, with which it is connected by a reef; the town of Sha tau kok stands on the western side of the inlet, 8½ cables west-south-westward of Ah kung tsui. Between Sha tau kok and a point, about one mile north-north-eastward, the coast is fringed by a bank of stones, which dries from one to 5 feet (0m3 to 1m5), and extends as much as 2 cables offshore abreast Sha tau kok.

There is a Custom house with a prominent flagstaff in Sha tau kok, and a tower, at the northern end of the town, is also prominent.

There is a stone pier at the southern end of the village, alongside which there is a depth of about 2 feet (0m6) at high water.

A detached patch, with a depth of one fathom (1m8) over it, lies

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Chart 3544.

about 3 cables southward of the Custom house flagstaff and 2¼ cables offshore.

A reef, which dries from 3 to 6 feet (0m9 to 1m8), lies on the south-eastern side of the inlet, about 6½ cables south-eastward of the Custom house flagstaff.

A prominent police station, with a flagstaff, stands on the northern side of the head of the inlet, about one mile south-westward of Sha tau kok, and a short distance inland; the village of Wo shek kok is situated on the coast southward of the police station.

Storm signals.—When local storm signals are displayed at Hong Kong, supplementary signals are displayed at Sha tau kok police station (*see* page 498).

Chart 3474.

Communication in Mirs bay.—Tai po and Sha tau kok (*Lat. 14° 33′ N., Long. 114° 14′ E.*) are connected to the railway system.

There is regular communication by steam launch between the more important towns and villages in Mirs bay.

Directions.—Caution.—No special directions are necessary for entering the various anchorages in Mirs bay.

Caution is required to avoid the numerous fishing stakes, on some of which platforms are built, in depths of from 6 to 9 fathoms (11m0 to 16m5), especially at night.

Chart 3605.

Tidal streams.—Along the western shore of the approach to Mirs bay, while the tide at Hong Kong is rising, the stream sets southward, but, at the same time, there is a very strong easterly set through Lema channel.

There is a strong indraught into Mirs bay and Rocky harbour while the tide at Hong Kong is falling; within the former, the tidal streams are almost inappreciable.

Charts 3605, 3002.

APPROACHES TO BIAS BAY.—The south-eastern side of the peninsula separating Mirs bay from Bias bay trends 8 miles east-north-eastward between Chun pei ngaam and Fei tang shan (Teyi point). The peninsula, of which the above-mentioned points are the southern and eastern extremities, respectively, is mountainous; its summit Ch'i-niang shan (Chee yung shan) is 2,861 feet (872m0) high, with a peak, 2,630 feet (801m6) high, midway between it and Fei tang shan.

Some rocks, above water, lie about one mile eastward of Chun pei ngaam, and 2 cables off a perforated point on the coast. Between a point about one mile north-eastward of the perforated point and a point about 1½ miles farther north-eastward there is a bay, the north-western shore of which is sandy; Lai shih chou lies about 3 cables eastward of the western entrance point of this bay.

Chart 3002.

A rock, which dries 2 feet (0m6), lies within the above-mentioned bay about 6 cables north-north-eastward of Lai shih chou, and 3 cables offshore.

There is another sandy bay entered about 2¾ miles east-north-eastward of Lai shih chou; White rock, which is remarkable, is the outermost of a group of several rocks above water lying close offshore

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Chart 3002.

about half a mile eastward of the north-eastern entrance point of this bay.

The approach to Bias bay from southward is between Fei tang shan and Fokai point, about 16 miles east-north-eastward. The Tuni ang group of islands and Middle rocks lie on the western side of the southern approach, and Hsiao hsing shan (Mendoza island), situated about 4 miles south-westward of Fokai point, with other islets between, on its eastern side.

Chart 3026.

From eastward, Bias bay is approached between Fokai point (*Lat. 22° 33′ N., Long. 114° 55′ E.*) and Pedro Blanco (page 519).

Islands and dangers.—Tuni ang group of islands lies about 2½ miles southward of Fei tang shan, separated from the peninsula between Mirs and Bias bays by a deep channel, about 1½ miles wide.

Chart 3002, plan of Samun road.

Ma huan (Tuni ang), with a conical summit, 988 feet (301m4) high, at its southern end, is the northernmost island of the group. Its northern and western sides are indented. There is a fort, with some Customs buildings close westward of it, on the summit of a projection, about 3 cables southward of the north-western extremity of the island; foul ground extends about 2 cables westward from the projection.

Islets and rocks, with foul ground around, extend about 9 cables westward from the north-western extremity of Ma huan; Net islet, the nearest, is shaped like a sugar loaf. Peak rock, 80 feet (24m4) high and appearing as two islets with a shingle beach between, lies a quarter of a mile south-westward of Net islet, and a reef, on which are some rocks above water, extends about 4 cables north-westward from Peak rock. The channel between these rocks and the mainland is clear of danger.

Kuei wan (Cone islet), with an islet about 1½ cables westward of it, lies about 2 cables off the south-eastern side of Ma huan, and San men (Samun island), 276 feet (84m1) high, lies farther south-eastward, separated from Kuei wan by a channel about 2 cables wide, in the fairway of which there is a depth of 8 fathoms (14m6).

San men (Samun) road is situated south-westward of Kuei wan and between Ma huan and San men.

Chart 3026.

Single islet, with a rounded summit, 200 feet (61m0) high, is the southernmost of the Tuni ang group, and lies about 1¾ miles south-south-eastward of San men.

Akong, a remarkable pyramidal rock, 100 feet (30m5) high, lies 6 cables north-eastward of Single islet, with deep water between; a rock, with a depth of 2¾ fathoms (5m0) over it, and which rises abruptly from a depth of 13 fathoms (23m8), lies about one mile north-eastward of Akong.

Chart 3002.

Middle rocks, which dry about 5 feet (1m5), are situated on the western side of the fairway of the southern approach to Bias bay, about 3¾ miles eastward of Fei tang shan. A reef, which dries about 5 feet (1m5) and on which the sea breaks, lies 3 cables south-westward of Middle rocks.

A 6-fathom (11m0) rocky patch lies about 9 cables north-north-eastward of Middle rocks.

Charts 1962, 2661b.

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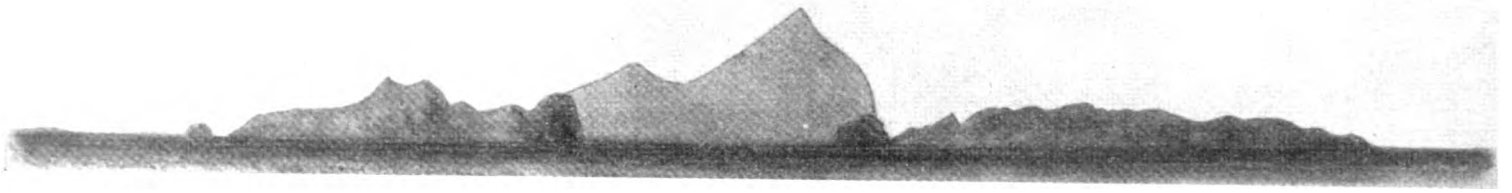
To face page 519.



Mendota island. *Harlem peak, bearing about* 017°. *Fokai point.*

Approach to Bias bay from southward.

(*Original dated* 1845.)

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Chart 3002, plan of Samun road.

Anchorages.—The best anchorage is in San men road, westward of the southern extremity of Kuei wan, in depths of from 7 to 8 fathoms (12m8 to 14m6), and sheltered from all winds except those from a south-westerly or westerly direction.

During south-westerly winds there is anchorage off the northern side of Ma huan, in depths of 9 and 10 fathoms (16m5 and 18m3), and also north-eastward of Kuei wan, in depths of from 10 to 12 fathoms (18m3 to 21m9).

In the North-east monsoon, junks anchor, in a depth of 9 fathoms (16m5), southward of Net islet and of Peak rock, and abreast the fort on Ma huan.

Chart 3026.

Outlying islet and dangers.—Dumping ground.—Pedro Blanco or Tai sing cham (*Lat. 22° 19′ N., Long. 115° 08′ E.*) is an islet lying about 18½ miles south-south-eastward of Fokai point.

Pedro Blanco has a white summit, about 130 feet (39m6) high, and is steep-to at a distance of a quarter of a mile; on northerly bearings it appears as two rocks.

Whale rocks lie in the approach to Bias bay from north-eastward, about 6 miles east-south-eastward of Fokai point; they consist of two rocks, on which the sea sometimes breaks, with deep water around.

Pauk piah, a flat rock, about 25 feet (7m6) high, lies about 6¼ miles eastward of Fokai point.

The coast, with its off-lying dangers, north-eastward of Fokai point is described in China Sea Pilot, Volume III.

Chart 2661b.

An area in which ammunition is dumped, with a radius of 5 miles and which is indicated by a pecked line on the chart, lies about 34 miles southward of Pedro Blanco.

Chart 3002.

Coast.—Off-lying islands.—Fokai point is the south-eastern extremity of a promontory connected with the mainland by a low isthmus. The promontory is 670 feet (204m2) high, and has the appearance of an island on easterly and westerly bearings. A fort stands on a hill, 393 feet (119m8) high, near the south-western end of the promontory, and a round tower, with a white mast close to it, stands about 1½ miles north-eastward of the fort; this tower is prominent when approaching from westward or southward, but is obscured when approaching from eastward.

Harlem peak, 2,070 feet (630m9) high, lies about 8 miles north-north-eastward of Fokai point and 1¾ miles inland (*see* view facing this page).

Hsiao hsing shan (Mendoza island) is 480 feet (146m3) high and has two peaks, rather like a saddle from some directions; shelter may be obtained from south-westerly winds on its north-eastern side. An islet lies close westward of Hsiao hsing shan, separated by a shallow boat channel.

Tsinku, an islet, 167 feet (50m9) high, with a remarkable cleft near its centre, lies 6 cables northward of Hsiao hsing shan.

Middle rock, 10 feet (3m0) high, lies about 6 cables westward of the point situated about 1½ miles westward of Fokai point, and may be passed on either side by small vessels.

Harlem bay.—Dangers.—Harlem bay is situated on the north-eastern side of the approach to Bias bay, between the point about

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Chart 3002.

1½ miles westward of Fokai point and a promontory formed by the southern extremity of a range of hills, about 4½ miles north-westward. On a point about one mile northward of the south-eastern entrance point, there is a fort; on the northern side of this point there is a creek which runs in a northerly direction through the isthmus, previously mentioned, and which junks can enter at high water.

Hebe islet (*Lat. 22° 34′ N., Long. 114° 53′ E.*), 70 feet (21m3) high and flat-topped, lies in the south-eastern part of Harlem bay, about 4 cables north-westward of the south-eastern entrance point, and on the outer edge of a shallow bank which extends offshore. A ledge of rocks, which dry, extends 3 cables north-eastward from Hebe islet, and a 3½-fathom (6m4) rocky patch lies about 3 cables south-westward of the islet.

Anchorage.—Directions.—Harlem bay affords anchorage, during the North-east monsoon, northward of Hebe islet in any convenient depth.

A vessel entering the bay from eastward should round Fokai point at a distance of about half a mile. Large vessels should pass westward of Middle rock and give the 3½-fathom (6m4) patch, south-westward of Hebe islet, a suitable berth.

BIAS BAY.—Islets and dangers.—Bias bay, known to the Chinese as Ta ya wan, is entered between Fei tang shan and Bias point, about 8 miles north-eastward.

Bias point is the western extremity of a small peninsula with three peaks, the eastern and highest of which has an elevation of 380 feet (115m8). A rocky ridge extends about 6 cables south-south-westward from the point, with a rock, 3 feet (0m9) high, at its extremity, and another, 38 feet (11m6) high, a short distance within. A rock, with a depth of 8 feet (2m4) over it, lies 6½ cables eastward of Bias point, and 2½ cables offshore; foul ground also extends 2½ cables westward from the point. On the shore of the bight, close northward of Bias point, there is a sand patch, and also a factory with a chimney, both of which are conspicuous.

Fa shan (Bate island), 293 feet (89m3) high and wooded, lies about 1¼ miles westward of Bias point. Little Bate island, a bare rock, 55 feet (16m8) high, lies 3 cables south-eastward of Fa shan, with depths of from 4½ to 8 fathoms (8m2 to 14m6) in the channel between. Foul ground extends 1½ cables from the northern end of Fa shan, on the outer part of which is Maung pai, a rock, awash.

Thornton rock, one foot (0m3) high, lies 6 cables north-north-eastward of the northern extremity of Fa shan. A pinnacle rock, with a depth of one fathom (1m8) over it, and a 2¼-fathom (4m1) rocky patch lies about 3 and 7 cables, respectively, north-north-eastward of Thornton rock.

In the channel between Fa shan and the foul ground extending from Bias point there are depths of from 3¾ to 7 fathoms (6m9 to 12m8), mud and sand.

This channel is not recommended owing to the possible existence of undiscovered pinnacle rocks.

The eastern side of Bias bay, between Bias point and Whaler point, about 4¼ miles northward, is fringed by a bank, with depths of less than 3 fathoms (5m5) over it, extending about one mile offshore in

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Chart 3002.

places. Triple islet, 147 feet (44m8) high at its southern end, lies on the outer edge of this bank, 2¼ miles north-north-westward of Bias point and 6 cables offshore. There is good anchorage, in the North-east monsoon, westward of Triple islet, in a depth of about 6 fathoms (11m0).

Station peak, 780 feet (237m7) high and conspicuous, lies about three-quarters of a mile inland, east-north-eastward of Triple islet.

On the western side of Bias bay, between Fei tang shan and a point, about 8½ miles north-north-westward, there is a bay; Tai pang wan (page 523) is situated at the head of this bay.

Lo ko (Lokaup island) (*Lat. 22° 35′ N., Long. 114° 39′ E.*), about 3½ miles north-north-eastward of Fei tang shan, is the southernmost of a chain of islands and rocks which occupy a large portion of the western side of Bias bay.

Lo ko is nearly divided in two places; its summit, 330 feet (100m6) high, is on the southern portion. Some pointed rocks lie off Pyramid point, the southern extremity of the island. A reef, near the northern end of which is Lokaup rock, 4 feet (1m2) high, extends 4 cables from the northern extremity. Several islets lie off the south-western side, the outermost of which is Cliff islet, at a distance of about half a mile. Two rocks, with depths of 3½ and 6½ fathoms (6m4 and 11m9) over them, lie about 3½ cables south-eastward and southward, respectively, of Cliff islet, and a 4¼-fathom (7m8) patch lies close southward of the islet.

Flat island lies close off the eastern side of Lo ko. An islet, 172 feet (52m4) high, lies about 3 cables eastward of the northern extremity of the same island, with The Pillars, an islet, 89 feet (27m1) high and remarkable for two square pillars on its southern side, about half a mile farther northward.

Harry rock, with a depth of 4½ fathoms (8m2) over it, lies 4½ cables northward of The Pillars.

Middle group consists of six islets; Hsiao la chia (Green islet), 358 feet (109m1) high, the southernmost of the group, lies about one mile north-westward of The Pillars. Hat rock lies close south-westward of Hsiao la chia, and there is a rock, with a depth of 2¼ fathoms (4m1) over it, 1½ cables off the eastern end of Hsiao la chia.

Square islet, 106 feet (32m3) high, lies about 4 cables north-north-eastward of the eastern extremity of Green islet, whence Hole islet, 87 feet (26m5), Red islet, 255 feet (77m7), and Tree islet, 117 feet (35m7) high, lie in that order and extend northward for 1¼ miles. A 2¾-fathom (5m0) patch lies 9 cables westward of Square islet.

Yuan chou (Reef islet), 243 feet (74m1) high, lies about one mile northward of Hsiao la chia; there is a reef, on which the sea breaks, a quarter of a mile south-eastward of it, and a rock, awash, 3 cables northward of it.

Harbour group consists of nine islets; The Twins, two islets close together, 106 feet (32m3) high, situated 9 cables northward of Tree islet, are the southernmost. Shoal islet, 236 feet (71m9) high, with rocky ground, on some parts of which there is a depth of only 3 feet (0m9), extending 3 cables north-westward from it, lies a quarter of a mile north-eastward of The Twins. Tree-a-top islet, 97 feet (29m6) high, lies a quarter of a mile west-north-westward of The Twins, with Pai sha chou (Sugarloaf island), 305 feet (93m0) high, half a mile farther north-westward.

Charts 3026, 1962, 2661b, 1262, 1263.

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Chart 3002.

Fairway rocks, awash, lie nearly 6 cables south-westward of Tree-a-top islet (*Lat. 22° 40′ N., Long. 114° 38′ E.*).

T'a chou (Narrow islet), 281 feet (85m6) high, lies 3 cables northward of Shoal islet. A bank, with a depth of 2¾ fathoms (5m0) over it, extends about three-quarters of a mile west-north-westward from between Shoal islet and T'a chou, and there is a 2½-fathom (4m6) patch about one mile westward of the northern end of T'a chou.

Son chou (Round islet), 198 feet (60m3) high, lies 2½ cables north-north-westward of T'a chou, with a depth of 4¼ fathoms (7m8) between. Flat rock, nearly awash, and steep-to, lies about one cable farther northward. Cone islet, 113 feet (34m4) high, surrounded by reefs which extend as much as a quarter of a mile from its southern end, lies about 6 cables north-westward of Son chou. Hsi chou (Big island), 341 feet (105m0) high, lies about 6 cables westward of Pai sha chou and the same distance off the southern entrance point of Ya ling wan. North Tree islet, 132 feet (40m2) high, lies close off the northern end of Hsi chou, and North rock, a flat rock with a reef, which is visible only at low water, lies about 3 cables farther northward. Ts'ao sha tui (Sand cay), a low rock surrounded by sand, lies 4 cables north-westward of Hsi chou. Fisherman rock, which dries about 3 feet (0m9), lies nearly in mid-channel between Hsi chou and the southern entrance point of Ya ling wan.

Ya chou (Slope islet), 177 feet (53m9) high, lies about one mile north-north-eastward of Hsi chou. The area comprised between Ya chou and North rock, on its western side, and Cone islet and Son chou, on its eastern side, is encumbered with reefs, on which some of the rocks are above water; the extent and nature of these can best be seen on the chart. O chou (Low islet), 125 feet (38m1) high, with another islet, 73 feet (22m3) high, close north-westward, lies about 1½ miles north-north-eastward of Ya chou. Kai pan, a rock, over which there is a depth of less than 6 feet (1m8), lies about one mile west-south-westward of O chou.

Sha yŭ lin (Dumbell island), 271 feet (82m6) high, lies about 6½ cables westward of Ya chou. Ch'uan chu chou (Sun chau), 250 feet (76m2) high, with a rock, with a depth of less than 6 feet (1m8) over it, close off its eastern extremity, lies about 6 cables northward of Sha yü lin, with Chi hsin chou (Spit islet), 149 feet (45m4) high, between them.

The eastern side of Bias bay, between Whaler point and Buffalo point, about 5 miles northward, is fringed by a bank, with depths of less than 3 fathoms (5m5) over it, extending as much as one mile off-shore. Tsun chou tao (Tsang chau), flat-topped, inconspicuous, and 95 feet (29m0) high, lies on the outer edge of this bank, about 9 cables south-westward of Buffalo point and half a mile offshore. From abreast Tsun chou tao for about 2 miles southward there are numerous sunken rocks on the fringing bank.

A narrow bank of stones, which dries, extends 1½ cables from the north-eastern end of Tsun chou tao, and some rocks, above water, lie close off the western end of the islet. An islet, 64 feet (19m5) high, and on which, in 1907, there was a prominent tree, is situated 1½ cables southward of Tsun chou tao.

Three conspicuous mountains lie inland from this part of the coast; Mount Hewett, 1,918 feet (584m6) high, lies about 4 miles east-north-eastward of Whaler point; Mount Bisbee, 1,989 feet (606m2) high,

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Chart 3002.

and Kao ao shan, 1,739 feet (530m0) high, lie about 2½ and 3½ miles, respectively, northward of Mount Hewett. There are numerous villages on these mountains and the valleys between are cultivated.

Fan ho chiang (Fan lo kong harbour) (page 524) is entered at the north-eastern end of Bias bay, between Buffalo point and Tai pai tau, about 2 miles northward.

Between Tai pai tau (*Lat. 22° 47′ N., Long. 114° 44′ E.*) and Wa shan tau, a prominent headland, 360 feet (109m7) high, about 2½ miles westward, there is a bight in the northern side of Bias bay. The shore of the bight is low and sandy. Sai pai, a rock with a depth of 5 feet (1m5) over it, lies nearly 2 miles westward of Tai pai tau, and about 9 cables offshore.

On the north-western side of Bias bay, Fu chau, 130 feet (39m6) high and connected to the mainland at low water, lies about half a mile west-south-westward of Wa shan tau.

Po tap chau, 85 feet (25m9) high, with a pagoda on its summit, lies about three-quarters of a mile south-westward of Fu chau and 3 cables offshore. The area between Po tap chau and the shore is foul, and a rock, awash, lies about 4 cables south-westward of the islet, with other rocks between.

Fishing stakes.—The whole of the northern part of Bias bay, from Ta chou eastward, is often thickly studded with strong fishing stakes connected with stout ropes, which are a serious obstacle to navigation by night. A clear passage may be found on the eastern side of the bay, near Tsang chau.

Anchorages.—There is good anchorage, in the North-east monsoon, about one mile westward of Triple islet, in a depth of about 6 fathoms (11m0); or anywhere in the eastern part of Bias bay, according to draught.

There is anchorage on either side of Lo ko, according to the direction of the wind. In October, 1935, when the wind was northerly, H.M.S. *Rover* anchored with Pyramid point bearing 125°, distant 5¼ cables, in a depth of about 7 fathoms (12m8), mud.

In the South-west monsoon, there is anchorage on the western side of Bias bay off Tai pang wan, in any required depth.

Tai pang wan.—Tai pang wan is entered between a point about 5½ miles north-westward of Fei tang shan, and a point about 1½ miles northward; this bay, although contracted, affords good shelter to moderate-sized vessels, except in easterly winds. Tsat long shan is situated a short distance westward of the northern entrance point, off which a bank, with depths of less than 3 fathoms (5m5) over it, extends about three-quarters of a mile. Between the southern entrance point and a point, about one mile westward, there are two shallow bays; the projecting points of these two bays are bold and steep-to. Vessels entering should keep the southern side of the bay aboard, and those drawing more than 15 feet (4m6) should not proceed farther westward than abreast the westernmost projecting point as the head of the bay is shallow.

Tai pang, a walled town, lies on the northern side, near the head of Tai pang wan, a short distance inland.

Ya ling wan.—Ya ling wan (Dumbell bay), in which the depths are mostly less than 3 fathoms (5m5), is entered on the western side of Bias bay, between a point about 4½ miles north-westward of Lo ko, and the

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Chart 3002.

south-eastern extremity of a peninsula, about 3 miles north-north-westward. The north-western side of Ya ling wan is indented. The town of Pa kong hu is situated at the head of the bay, about 5½ miles westward of the southern entrance point.

Chih ma chou (Hogsback island), 328 feet (100m0) high, with an islet close off its eastern end, lies close southward of the northern entrance point of the bay.

Tao shih chou (Dome islet), 141 feet (43m0) high, with some rocks, both above-water and awash, a short distance from its eastern side, is the easternmost of a group of islets lying near the head of Ya ling wan.

Fan ho chiang.—The entrance to Fan ho chiang (Fan lo kong harbour) is barred by a bank, which extends north-north-westward from Buffalo point and is connected with the bank extending from the northern side of Bias bay; there is a least depth of 2¾ fathoms (5m0) in the fairway over this bar.

Fan ho chiang is reported to be the best anchorage in Bias bay during a typhoon.

The south-eastern side of the harbour is formed by rocky points, fringed by a drying mudbank, extending from one to 3 cables offshore, and with depths of less than 6 feet (1m8) extending from one to 2 cables farther offshore.

Tai pai tau, the northern entrance point, is high and rocky, with rocks, one of which is 4 feet (1m2) high, lying close off it. The north-western side of the harbour is fringed by a bank, with depths of less than 6 feet (1m8) over it, extending from 2 to 4 cables offshore.

Port reef, with a depth of 4 feet (1m2) over it, lies about 4½ cables south-eastward of Tai pai tau (*Lat. 22° 47′ N., Long. 114° 44′ E.*).

The head of the harbour is fringed by a drying mudbank, extending out about half a mile, and depths of less than 6 feet (1m8) extend about one mile farther.

The harbour is surrounded by hills; Sao chai san, 1,374 feet (418m8) high and conspicuous, lies on the northern side, about 2 miles north-eastward of Tai pai tau, and, on the southern side, the hills attain an elevation of about 1,000 feet (304m8).

The town of Fan ho kang (Fan lo kong) and several villages are situated on a cultivated plain, backed by hills, at the head of Fan ho chiang.

Tidal streams.—The tidal streams in Bias bay turn about half an hour before high and low water at Hong Kong, and attain a spring rate of three-quarters of a knot.

Off Bias bay the stream sets westward from about half an hour before low water at Hong Kong to half an hour before high water there, and eastward the rest of the time; the rate is less than half a knot. During the monsoon the westerly drift current of about half a knot causes the set to be constantly westward at a rate which does not exceed one knot.

Communication.—There is regular steamboat communication between Hong Kong and Ya ling wan.

Charts 3026, 1962, 2661b, 1262, 1263.

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CHAPTER XII

TAM KONG, AND HSI CHIANG WITH ITS TRIBUTARIES

Chart 2562.

TAM KONG.—The approach to the Tam kong, or South-west river, is described on page 450, and the entrance on page 452. From Yai-men the river runs through hilly country.

Chart 2661a.

The Tam kong is navigable at low water, by a vessel drawing 7 feet (2^m1), as far as Hsin-ch'ang (Sun cheong), 27 miles westward of the northern end of Yai-men, and is apparently clear of dangers. Above Hsin-ch'ang (*Lat. 22° 22′ N., Long. 112° 33′ E.*) it is shallow, and there are numerous rocks and bars. The banks are uniformly low and flat, and the land bordering the river is cultivated.

Some of the fishing stakes up the river extend nearly the whole width of the river; care should be taken when rounding these as the water may be shoal.

Chart 3588.

Yai-men (Ngae mun) is the principal channel leading into the Tam kong from seaward. East tower and the Custom house on the eastern side of the entrance are mentioned on page 453; a ruined fort stands on the eastern bank about one mile north-westward of East tower. An overhead telegraph cable spans the river here.

A rock, which dries 2 feet (0^m6), lies about 2 miles north-north-westward of the ruined fort, and one cable off the western bank; a large patch of rocks, which dries 3 feet (0^m9), is situated about $7\frac{1}{2}$ miles farther northward, and $1\frac{3}{4}$ miles above a pagoda at the foot of some low hills on the eastern bank. This rocky patch is near the middle of the channel, but is easily avoided by keeping over to the eastern bank after passing the pagoda.

Muk chau creek, which connects Yai-men through other creeks, with the Hsi chiang (Si kiang) (page 526), is entered on the eastern side about $2\frac{1}{2}$ miles northward of the above-mentioned pagoda, and, on the western side, abreast the mouth of Muk chau creek, and close offshore, is the southern end of a flat island; vessels proceeding into the Tam kong should keep in midstream abreast this island, and alter course north-westward when the northern end of the island is abeam.

The mouth of Hsiang Hai (Kongmoon creek), which leads into the Hsi chiang, about 11 miles northward, is situated on the north-eastern side of Yai-men, about one mile north-eastward of the northern end of the above-mentioned flat island.

Chart 1263.

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Chart 2562.

About 3 miles north-westward of the mouth of Hsiang Hai, the Tam kong is divided into two branches by islands.

Sek tsui, a village, is situated on the south-western bank of the southern branch, about 2 miles above its entrance. This branch, though tortuous, was navigated by H.M.S. *Robin*, in 1936, without difficulty, and is unobstructed and deep except for some rocks lying in midstream near its western end, where a vessel should keep close to the northern bank. This branch is largely used by tows.

The northern branch is deep, and apparently clear of dangers.

There is a conspicuous house on the eastern bank, about 2¼ miles northward of the entrance to the northern branch.

The town of Sunwui (*Lat. 22° 31′ N., Long. 113° 02′ E.*) stands about one mile inland from the north-eastern bank of the northern of these two branches.

From the position where these two branches meet, about 7 miles south-westward of Sunwui, and after passing some hills, the river continues about 8½ miles in a south-westerly direction to Kung yik, where there is a railway bridge.

Chart 2661a.

Above Kung yik, the river turns southward, and 3½ miles from that town, and almost abreast the first of two small islands on the south-eastern side, there is a bar, with, apparently, a least depth of 7 feet (2^{m}1). The cities of Chang (Cheong) sha and Hsin-ch'ang are situated on opposite sides of the river about 3 miles farther up. The water front on both sides is congested with junks and sampans, and there are usually a number of junks at anchor, so that it is more convenient to anchor just below these cities.

In June, 1919, H.M.S. *Robin* proceeded to Chikhom (Chek-hum), 9 miles above Hsin-ch'ang. She reported as follows:—

At Chikhom (*Lat. 22° 20′ N., Long. 112° 24′ E.*) a barrier of piles and stones extends across the river for two-thirds of its width, leaving a passage for small vessels only.

For 42 miles above this town to the town of Yuen cheong the river is navigable for vessels of one foot (0^{m}3) draught only, and from information obtained, it appears there is a small stream at Yuen cheong which connects it with Hainan strait.

The Tam kong district is prosperous and the towns are well laid out.

Climate and weather.—*See* page 36.

Chart 3588.

Directions.—Entering Yai-men, the ruined fort on the eastern bank, near the entrance, should be closed to pass under the telegraph cable. It may be necessary to house the topmast for this at high river.

A vessel should pass westward of the fishing stakes just below the conspicuous house situated on the eastern bank about 1½ miles southward of Sunwui as there are groynes extending from the eastern bank.

Chart 2562.

HSI CHIANG.—The Hsi chiang (Si kiang or West river), also known as the Blue river, has its source in the province of Yunnan, and discharges into the China sea through a delta, the base of which is about 26 miles wide between Kok tsui shan (*Lat. 21° 57′ N., Long.*

Chart 1263.

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Chart 2562.

113° 02′ E.) (page 452) and Ta-heng-ch'in (page 453). The Broadway, on the eastern side of the delta, is the principal entrance.

In its lower reaches, the western side of Hsi chiang is connected by several creeks with the Tam kong; between its mouth and San-shui (Samshui) junction, about 75 miles north-north-westward of Ta-heng-ch'in, its eastern side is connected with the Chu chiang, or Canton river system, by a large number of creeks and channels; most of these are described in Chapter XIII.

At San-shui junction the Pei chiang (page 568) flows into the Hsi chiang from northward.

Chart 2661a.

From San-shui junction the Hsi chiang trends westward past Ts'ang-wu (Wu-chau) and T'eng-hsien (Tang-hsien), to near Kuei-p'ing (page 553), where it turns southward. Here the main river is joined by the Ch'ien chiang (Wu or Hong kiang) from north-westward. About 50 miles north-westward of Kuei-p'ing, the Ch'ien chiang is joined from northward by the Liu (Lieu) chiang, whence it continues westward to its source in Yunnan.

From Kuei-p'ing, the Hsi chiang trends southward and westward to Yung-ning (Nan-ning Fu) (*Lat. 22° 42′ N., Long. 108° 03′ E.*), and 11 miles westward of that city it is joined from south-westward by the Li chiang and from north-westward by the Yu chiang, by which river shallow-draught vessels can ascend to Pai-se (Poseh), a distance of over 120 miles.

Navigability.—Vessels with a draught of 13 feet (4m0) can reach Ts'ang-wu (Wu-chau), about 180 miles by river above the entrance, at high river during the month of June, and those with a draught of from 6 to 7 feet (1m8 to 2m1) can reach it at low river. To cross Second bar and the shoal water below Ts'ang-wu at all times of the year, vessels should have a draught not exceeding 5 feet (1m5), and good steering qualities. For rise of the river and navigability above Ts'ang-wu, *see* pages 548 and 549.

General information.—Caution.—In the narrow channels and creeks, etc., of the delta of the Hsi chiang, and also that of the Chu chiang (page 598), vessels should always proceed at such a speed that the waves caused by their motion through the water do not damage the banks, etc., especially when passing villages. Speed should be reduced when passing tows or heavily-laden junks, and a careful lookout should be kept for tows hauling out from the banks or emerging from other reaches.

There are many groynes, but generally they are small; they should be kept in mind if hauling close to a bank. In some places barriers have been built, leaving only a narrow navigable channel. Saiwan barrier (page 632) and a barrier extending from the south-western end of Brine island (page 624) are important ones.

Overhead telegraph cables, at varying heights above the level of the river, span the rivers and creeks in many places and are erected or removed without notice.

No vessel should enter any of the channels, creeks, etc., of the Hsi chiang and Chu chiang deltas without a pilot or without local knowledge.

Rule of the road.—In the shallow passages of the deltas of the Hsi chiang and Chu chiang, the rule of the road is not strictly followed.

Chart 1263.

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Chart 2661a.

A long blast, on the whistle or siren, is usually sounded when it is considered that a meeting may occur in a position in which care in passing will be required, and when a decision as to the side of passing, is desired. Usually the vessel proceeding with the current will indicate, either by one short blast that she desires to haul over to her starboard side of the channel, or by two short blasts that she desires to haul over to her port side of the channel. The vessel proceeding against the current generally hauls over to the opposite side of the channel and stems the stream until the vessel proceeding downstream has passed.

In clear channels the Regulations for Preventing Collisions at Sea appear to be generally followed.

Chart 2562.

Southern entrances.—There are three entrances from southward to the Hsi chiang; the approach to Hu-t'iao men, the westernmost, is the same as that for the Tam kong and is described on pages 450-452. The approach to the other entrances lies between Kao lan (page 451) and Wanshan chuntao (Ladrone islands) (page 459).

Chart 3588.

Hu-t'iao men.—Directions.—The channel in the entrance to Hu-t'iao men (Fu tiu mun) is narrow between shoals extending offshore on both sides. Fu tai, or Fu si, an islet, 15 feet (4^{m}6) high, lies nearly in mid-channel about 2 miles north-eastward of Yai-men Customs station, near the north-western entrance point of Hu-t'iao men; vessels should pass between this islet and the north-western bank. On the south-eastern side of the river, and extending nearly half way across it, there is a rocky patch, part of which dries 3 feet (0^{m}9), about 1½ miles east-north-eastward of Fu tai (*Lat. 22° 14′ N., Long. 113° 08′ E.*). Swirls, which appeared to indicate a rock, were observed, in 1937, about one cable north-eastward of these rocks. A stone pier, situated close northward of the village of Tsu hau tong, extends from the south-eastern bank about half a mile farther north-eastward. Northward of the pier, for a distance of about 3½ miles, the middle of the river is occupied by a series of six low, flat islands. Pui Custom house is situated on the western bank of the river abreast the southernmost of these islands.

A stone barrier, which dries one foot (0^{m}3), extends in a northeasterly direction from the northern extremity of the third island from southward. Two dangerous sunken barriers extend from the western bank, about half way across the river, between the northernmost island and the entrance to Oyster barrier, about 3 miles northward.

Oyster barrier, in the entrance to which there is a depth of 6 feet (1^{m}8), is a creek which connects Hu-tiao men with Holmes creek (page 534).

Northward of Oyster barrier, Hu-t'iao men is divided into two branches; there is a sunken groyne on a drying sandbank at the southern end of an islet in mid-channel off the western entrance of Oyster barrier. The western branch is connected with Muk chau and other creeks.

H.M.S. *Sandpiper*, in November, 1908, examined Lu lu creek, the eastern of these two branches. A rock, with a depth of 2 feet (0^{m}6) over it, lies nearly in mid-channel, about 1½ miles northward of the

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Chart 3588.

entrance, and an island lies in mid-channel, about 2 miles farther northward. Abreast this island, and also about one mile northward of it, the western side of Lu lu creek is connected by other creeks with Muk chau creek; a village, in which there is a temple, stands on the western bank, about one mile northward of the island, and, about one mile farther north-eastward, Lu lu creek joins Holmes creek.

Lu lu creek is narrow and is obstructed by sunken groynes.

Chart 2562.

The Broadway.—Islands and dangers in approach.—Beacons.—The two eastern of the southern entrances to the Hsi chiang are divided by a bank, parts of which dry; this bank, partly covered with grass, extends in a south-easterly direction, for 12 miles from Teng-lung sha (Tanglungwai), an island, situated about 6 miles northward of San Tsao (page 451). The channel on the south-western side of this bank leads to Ni-wan men (page 533), and The Broadway, which is the channel on the north-eastern side of it, leads to Lo-chou men (Mo to mun).

The Broadway is used by small steamers with a draught up to about 9 feet (2^m7), and by trading junks, during daylight. The best time to enter is with the first of the in-going stream. There are usually lines of fishing stakes across the entrance, with passages between. Depths of less than 3 fathoms (5^m5) were reported by H.M.S. *Cockchafer*, in 1889, to extend farther south-eastward of San Tsao than charted.

On the western side of the approach, Shih-wan (The Stragglers), a group of islets, lies off the south-eastern side of San Tsao, the outermost at a distance of about three-quarters of a mile; the innermost lies at a distance of about half a mile and is connected to San Tsao by a mudbank. Ta-kang (South-west island), with another island close westward, lies about one mile north-north-eastward of the outermost Shih-wan and Ma-tsung (Coffin island), about three-quarters of a mile farther northward.

Heng chou (Ross island) lies on the south-western edge of the bank between the two channels, about 7 cables eastward of Red Cliff head (*Lat. 22° 05′ N., Long. 113° 24′ E.*), the north-eastern extremity of San Tsao. An islet and a rock, with a depth of less than 6 feet (1^m8) over it, lie close off the south-western end of Heng chou; these are separated from an islet lying close off San Tsao, a short distance south-eastward of Red Cliff head, by a narrow channel, in the fairway of which there are depths of over 5 fathoms (9^m1).

Double islets lie on the same bank, about 6 cables south-eastward of Heng chou.

There is good anchorage north-westward of Heng chou, with fair holding ground, but the tidal streams are strong.

On the eastern side of The Broadway, Adams peak, the summit of Ta-heng-ch'in (Wong kum) (page 453), is 1,509 feet (459^m9) high. Shih-lan chou (Water islets) consists of two islets close together, with a rock, having a depth of less than 6 feet (1^m8) over it, between, and two similar rocks lying close eastward of them, lie about a quarter of a mile southward of Ta-heng-ch'in.

Hsiang chou (Inside islet) lies about one mile north-westward of Shih-lan chou and a short distance offshore. Shen-ching wan (Lark bay) is entered between Morgan point, the western extremity of

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Chart 2562.

Ta-heng-ch'in, and a point about 8 cables south-eastward; two rocks, close together, and awash, lie close westward of the southern entrance point of this bay; it was reported, in 1928, that the positions of these two rocks could be identified at any state of the tide.

A rock, which dries, and which is marked by a spar beacon, lies almost in mid-channel, 1¼ miles north-westward of Morgan point; vessels should pass close westward of this rock. Another rock, awash, and which is marked by a white pillar beacon with a red top, lies about one mile westward of the last-mentioned rock, and well within the eastern edge of the extensive bank extending from Teng-lung sha (*Lat. 22° 13′ N., Long. 113° 21′ E.*).

Hsiao-heng ch'in (Macarira island) lies about half a mile northward of Ta-heng-ch'in and is connected with it by a mudbank. A bank, which dries one foot (0m3) at its northern end, extends about 2½ miles north-westward from Massie point, the western extremity of Hsiao heng-ch'in. Ta kang (Mong chau), with Mang chou, another islet about 2 cables northward, lies on this bank, about 8 cables north-westward of Massie point. The old fort on Ta kang, which is a white square tower, is prominent, and a Customs station, consisting of white buildings on the middle hill of the islet, is also noticeable.

Lappa island lies about one mile northward of Hsiao heng-ch'in, with a narrow channel (*see* page 579) between them; it is separated from Macao island, northward of it, by a boat passage.

Chart 3588.

Yu-chi shan (Im tun shan), 698 feet (212m7) high, is the summit of an island close westward of Lappa island, which is separated from the latter by Pirates creek; a rock, with a depth of less than 6 feet (1m8) over it, lies close off the western extremity of this island; Ma on shan rises within this extremity.

Lo chou men is entered between the western extremity of the above-mentioned island and the south-eastern extremity of Teng-lung sha, about 2 miles north-westward.

Chart 2562.

Hao chou (Pak tang) lies on the bank which separates The Broadway from the channel leading to Ni-wan men (Nei wan mun), about 4 miles north-north-westward of Red Cliff head. Pai-t'eng (Skeleton or Grave island) lies on the south-western side of the channel leading to Ni-wan men, about 1½ miles westward of Hao chou, and is connected with San Tsao by a bank, which nearly dries in parts. San-pan (Central islets), two in number, lie about half a mile off the south-western side of Pai-t'eng. Mosquito spit, with a depth of 2 feet (0m6) over its northern extremity, extends 2 miles north-north-westward from Pai-t'eng. The northern end of Jin foon shan channel, which is narrow, lies between Mosquito spit and Target point, situated about 2½ miles north-north-westward of the western extremity of Pai-t'eng; this channel leads south-westward into Chi-li men.

For the channel between San Tsao and Ta-lin (Lam puk sui), south-westward of Pai-t'eng, *see* page 452.

Chart 3588.

Ni-wan men is entered between Target point and Cicala point, on the south-western side of Teng-lung sha, about 6 cables northward.

Chart 2562.

Tidal streams.—Outside the entrance of Hsi chiang, the direction

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Chart 2562.

of the flood stream is governed principally by the wind; with strong easterly winds it runs west-north-westward, and with south-westerly winds it runs northward. The ebb stream runs generally south-westward. Inside the river the tidal streams take the direction of the channel.

Chi-li men.—The southern entrance of Chi-li men (Black Dog's creek) is situated about one mile north-westward of Chip islet (page 452). The creek runs in a northerly direction through Ta-lin and is navigable by shallow-draught vessels with local knowledge. On its eastern bank, about 2½ miles northward of the entrance, there is a conspicuous white tower. Abreast this tower, from the western bank, a creek, available for motor boats, leads to Kin mo, a town with a population of about 34,000, situated about 4½ miles north-westward of the white tower.

The mud banks on either side of the northern end of this creek dry about 2 feet (0m6), and are steep-to.

Chart 3588.

The main channel.—Lo chou men.—On the eastern side of Lo chou men (Mo to mun), the entrance to which is described on page 530, the southern end of Teng-lung shan (Tang lung chau) lies about 1¾ miles north-north-westward of Ma on shan. Teng-lung shan is separated from the south-western side of Macao island by a channel, about half a mile wide at its southern end; from the eastern side of this channel several creeks run into the interior of Macao island. The northern portion of this channel has not been surveyed.

For the channel, eastward of Teng-lung shan leading to Macao harbour, *see* page 580.

Sheong ma kok (*Lat. 22° 16′ N., Long. 113° 21′ E.*), on which is a joss house, is the south-western extremity of a range of hills on Macao island, and lies about one mile north-westward of the northern end of Teng-lung shan. A shoal, which dries, lies parallel with the river bank close off Sheong ma kok. Chu P'ai sha (Dog island) lies nearly in mid-channel, abreast Sheong ma kok, the channel being about 3½ cables wide between it and Macao island. From the south-eastern end of Chu P'ai sha, a narrow bank, parts of which dry and which is steep-to on either side, extends about 4½ miles south-eastward.

Mo tao (Mo to), a hilly island, on which there is a fort, lies on the eastern side of the channel, about half a mile northward of Chu P'ai sha, and is separated from Macao island by Grindstone creek, in which there is a least charted depth of 2 feet (0m6).

Between Mo tao and the southern end of Kwongfuksha, an island, about 4 miles north-north-westward, three islands lie on the eastern side of the channel; the creeks which separate these islands connect the main channel with the approach to Nemesis creek, the southern end of which is situated close eastward of the southern end of Kwongfuksha. Nemesis creek (page 613) connects the Hsi chiang with the Chu chiang system.

On the western side of Lo chou men, three islands, Sansha, Lo chau, and Chuk chau, lie north-north-westward of Teng-lung sha; the northern extremity of Chuk chau being situated 10½ miles from the latter. Lo chau is separated from the other two islands by creeks which connect Lo chou men with Lo chau creek (page 532). Portions of these islands are elevated above the level of the reclaimed land of

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Chart 3588.

which they partly consist; Stripe cliff is situated on the south-eastern end of Lo chau, 8½ cables inland. Tree point, close off which are some sunken rocks, lies on the eastern side of Lo chau, about 1¼ miles northward of Stripe cliff. There are white and red cliffs situated a short distance inland at the northern end of the same island; sunken rocks lie close offshore abreast both these cliffs. There is a red cliff on the eastern side of Chuk chau, and another at its northern end. There is a rock, with a depth of less than 6 feet (1m8) over it, about 1¼ miles south-eastward of the northern end of Chuk chau and close offshore.

A groyne, about 2 cables long, is situated at the inner end of a spit which extends half a mile north-westward from the northern end of Chuk chau; a detached shoal, over which there is a least depth of one foot (0m3), lies eastward of the groyne and close offshore.

Lo chau creek is entered from northward close westward of the northern end of Chuk chau (*Lat. 22° 23′ N., Long. 113° 15′ E.*).

Moorhen creek (page 533) is entered from south-eastward between the northern end of Chuk chau and the southern end of an island about half a mile northward; the entrance to this creek from Lo chou men is very narrow.

An island, also named Chuk chau, lies nearly in mid-channel about half a mile north-eastward of the northern end of Chuk chau; northward of this island there are a number of islands on the western side of the main channel. On the eastern side, some sunken rocks lie close off the north-western end of Kwongfuksha, situated about 2¾ miles northward of Chuk chau. An islet lies in mid-stream about three-quarters of a mile farther northward; a spit extends about 3 cables from the northern end of this islet, and there is a small groyne extending from its eastern side; abreast the islet, a rock, with a depth of less than 6 feet (1m8) over it, and the existence of which is doubtful, is charted close off the eastern bank. The channel is between the islet and the eastern bank.

Kep siang, an island, with a spit, having a depth of 6 feet (1m8) over it, extending for a short distance from its northern end, lies on the eastern side of the channel, about 1⅓ miles north-north-westward of the last-mentioned islet. Shekkei creek joins the Hsi chiang abreast the south-eastern end of Kep siang, and Lung kong creek, abreast its north-eastern end.

A rock, with a depth of less than 6 feet (1m8) over it, lies a short distance off the western bank abreast the northern end of Kep siang. A police hut stands on the western bank about 2¼ miles north-westward of Kep siang; about 1½ miles farther north-westward, the main river is joined from southward by Holmes creek. From the police hut to Split point, the northern extremity of the island which divides the two streams, a bank extends from 2 to 3 cables offshore. Groynes extend from both banks of the main river just below the junction, one of which, close northward of the police hut, appears to extend farther than the others.

From the above-mentioned junction, the river trends 4 miles northward, and is broad, deep, and free from dangers as far as Gruning shoal, an extensive sandbank, and which is steep-to on both sides. Gruning shoal is situated close off the south-eastern end of Chau lin, an island separated by a narrow channel, in the fairway of which

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Chart 3588.

there is a least depth of 14 feet (4m3). At Gruning shoal the river divides into three branches; the western branch (page 535) leads to Pei-chieh (Pakkai), the port of Chiang-men (Kongmoon); Chau lin channel, the north-western branch, and the main channel of the Hsi chiang, runs between Chau lin and Futong, an island, close north-eastward; Sandpiper creek (page 537), the northern branch, runs along the eastern side of Futong, and rejoins the Hsi chiang at the northern end of that island.

Wai-hai (Ngaihai), a village, is situated on the southern bank, abreast the south-eastern extremity of Chau lin; a tower stands on the river bank close north-eastward of Wai-hai.

Wu chun hill, 185 feet (56m4) high, lies on the eastern bank of the main river, about one mile eastward of the south-eastern extremity of Chau lin.

Ni-wan men.—From its entrance (page 530), Ni-wan men (Nei wan mun) runs in a north-westerly direction for about 7 miles, where it is joined from north-eastward by Lo chau creek; 3½ miles farther north-westward, Ni wan men joins the southern end of Holmes creek, and Oyster barrier connects its western side with the southern end of Lu lu creek (page 528).

About half a mile north-westward of Target point (*Lat. 22° 11′ N., Long. 113° 18′ E.*), Jubilee reef, some of the rocks on which are above water, extends off the south-western bank nearly half way across the channel towards Cicala point. Dollar rocks extend three-quarters of a cable from the eastern bank about half a mile northward of Cicala point, and 1½ cables below a landing stage. Abreast Dollar rocks, on the western side of the channel, there are two piers.

The southern end of Robbers creek enters the eastern side of Ni wan men, about 1¼ miles north-north-westward of Cicala point; a submarine cable, indicated on the chart, crosses the river close southward of the entrance to Robbers creek. Teal islands, two in number, lie off the western bank of Ni wan men, about 1½ miles farther north-westward. A shoal lies nearly in mid-stream, on the western side of the channel, about 3 cables northward of the northern Teal island.

Pineapple peak lies about one mile inland from the eastern bank, north-eastward of the northern Teal island.

Two islets lie off the southern end of the island which separates Lo chau creek from Ni wan men; a spit extends a short distance from the southern end of the southern islet, and a sunken groyne extends a short distance from the south-western bank of Ni wan men, abreast the northern islet.

Lo chau creek trends northward as far as the northern end of Chuk chau (page 532), where it joins the southern end of Moorhen creek.

Near its southern end, Lo chau creek is connected with Lo-chou men, eastward, through the northern part of Robbers creek and other creeks. The creek which runs between the islands of Lo chau and Chuk chau is mentioned on page 531; a swirl has been observed off the eastern bank of Lo chau creek near the entrance to this creek. The least charted depth in the fairway of Lo chau creek is 9 feet (2m7).

Moorhen creek, the entrance to which from Lo chou men is mentioned on page 532, runs about 6 miles north-north-westward from the northern end of Chuk chau, where it joins Holmes creek. A joss house stands on the south-western bank of Moorhen creek, about

Charts 2562, 2212, 2661a, 1263.

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Chart 3588.

3½ miles above the northern end of Chuk chau ; a bank, on which are some rocks, with depths of less than 6 feet (1m8) over them, extends nearly into mid-channel abreast the joss house. A short distance westward of the joss house there is a tower, the position of which is approximate.

The north-eastern bank of Moorhen creek, almost as far as the joss house, consists of islands, between which there are narrow streams connecting the creek with the main channel of the Hsi chiang.

Abreast the joss house, Moorhen creek is divided into two branches by two islands, separated from one another by a shallow creek. The southern end of the north-eastern branch, which is the one normally used, is encumbered by a shoal which dries, in mid-channel ; vessels should pass between this shoal and the eastern bank. Sunken groynes project from the southern bank of the north-western branch opposite the southern side of the northern of the two last-mentioned islands ; a fort (*Lat. 22° 28′ N., Long. 113° 11′ E.*) stands on a hill on the north-western end of this island. A bank, on which there are some rocks, with depths of less than 6 feet (1m8) over them, extends nearly half way across the channel from the northern side of the same island near the fort, and a sunken groyne extends from its western side.

Muk chau creek, which joins the northern end of Moorhen creek south-westward of the island with a fort on its northern end, is described below.

Holmes creek, between the eastern end of Oyster barrier (page 528) and its junction with the northern end of Lu lu creek, is about 6 miles long. About one mile southward of this junction, sunken groynes extend from both banks, and a bank, on which are some sunken rocks, extends a short distance from the eastern bank ; a similar bank extends a short distance from the north-eastern side of the point where Lu lu creek joins Holmes creek. About 6 cables north-westward of this junction, a rock lies close off the north-eastern bank, abreast a small mound. A short distance farther northward, Holmes creek is joined from westward by the two branches of Muk chau creek, and, from eastward, by the two branches of Moorhen creek. Abreast the southern entrance to the southern branch of Moorhen creek there is a shoal, with a least depth of 6½ feet (2m0) over it, in mid-channel, which should be passed on its eastern side. The groyne extending westward from the southern entrance point of the northern entrance to Moorhen creek, is mentioned above.

About 4 miles northward of its junction with Moorhen creek, Holmes creek joins the main channel of the Hsi chiang.

Muk chau creek.—Muk chau creek was visited, in 1935, by H.M.S. *Robin*. The creek was found to be wide except at its eastern end, where it narrows, but the banks there are steep-to and there are no dangers. In the fairway there was found to be a depth of not less than 14 feet (4m3).

From its western entrance (page 528), Muk chau creek runs in an east-north-easterly direction for about 3½ miles, where it turns sharply and trends northward for about 2 miles and then southward and eastward for another 2 miles where it joins Holmes creek abreast the northern end of Moorhen creek.

The village of Muk chau is situated on the northern bank about 1¼ miles from the north-eastern end of the creek.

Charts 2562, 2661a, 1263.

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Chart 3588.

Two miles from its western entrance, and again when it turns northward, Muk chau creek is connected to other creeks, running eastward and south-eastward with Lu lu creek. About half a mile westward of Muk chau village another creek joins Muk chau creek from north-westward, and connects the latter with Kongmoon river, northward, and with Hsiang Hai, westward.

The eastern end of Muk chau creek is divided into two branches by an island, with an islet close off its north-eastern end; a rock, with a depth of less than 6 feet (1m8) over it, lies in mid-stream at the eastern end of the southern branch. A rock, with a depth of less than 6 feet (1m8) over it, lies eastward of the entrance to the northern branch midway between the last-mentioned islet and the southern end of an island lying close off the western bank of the river, just northward of the eastern end of Muk chau creek; there are three chimneys at the northern end of this latter island, and an islet lies close eastward of its northern end and abreast the fort at the northern end of Moorhen creek, mentioned on page 534.

Dangers.—A stone wall extends from the northern side of the western entrance of Muk chau creek, almost as far as the southern entrance point; the latter is steep-to, although appearing shallow. This danger can be avoided by keeping the southern bank aboard.

About one mile from the western entrance, a sunken wall, with a depth of 4 feet (1m2) over it, extends from the south-eastern bank nearly into mid-stream; the stream runs strongly between this wall and the rocks, 8 feet (2m4) high, near the opposite bank. At the position where the creek turns northward, two sunken groynes extend for a short distance from the north-western bank.

Tides.—Tidal streams.—In Muk chau creek the stream nearly always runs in a westerly direction, being strongest at low water; the range of the tide appears to be about 4 feet (1m2).

Chiang-men and approaches.—Hsiang Hai.—About 1½ miles northward of its southern entrance (page 525), Hsiang Hai (Kongmoon creek) is joined by a creek which connects it with Kongmoon river, about 3 miles east-north-eastward, and also with Muk chau creek. From about 3 to 5 miles from its southern entrance Hsiang Hai is divided into two branches by islands, and, about 2½ miles farther northward, a guard house (*Lat. 22° 33′ N., Long. 113° 04′ E.*) stands on the western bank. About 1¼ miles north-north-eastward of the guard house the creek is joined by Kongmoon river from south-eastward and about 3 miles farther north-eastward Hsiang Hai joins a branch of the Hsi chiang. The city of Chiang-men (Kongmoon) is situated on the western bank of Hsiang Hai, about 1½ miles south-westward of its northern entrance.

The least depth in Hsiang Hai is 5 feet (1m5), but there are depths of from 20 to 25 feet (6m1 to 7m6) in places. Vessels proceeding to Chiang-men from south-westward invariably use Hu-t'iao men (page 528) rather than Yai-men and Hsiang Hai.

Tidal stream.—The current always runs in a southerly direction through Hsiang Hai.

Eastern approach to Chiang-men from the Hsi chiang.—The channel leading to Chiang-men southward of Chau lin is mentioned on page 533. There was, in 1932, a depth of 24 feet (7m3) in the fairway of this channel as far as Edgell island, 150 feet (45m7) high,

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Chart 3588.

about 1¾ miles westward of the south-eastern end of Chau lin. The eastern entrance to the channel is narrow between Gruning shoal and a shoal, consisting of sand and gravel, which extends a short distance off the south-western bank near Wai-hai (page 533). A rock, with a depth of 3 feet (0m9) over it, lies on the southern side of the fairway, about 7 cables eastward of Edgell island; this island can be passed on either side.

A shallow spit extends a short distance from the southern bank close eastward of the northern entrance to Hsiang Hai; northward of this spit, and connected with the western end of Edgell island, a bank, with depths of from 2 to 6 feet (0m6 to 1m8) over it, extends across the river.

For the channel of approach to Pei-chieh from northward, *see* page 537.

Pei-chieh.—Pei-chieh (Pakkai), the port of Chiang-men, is situated on the western bank, close northward of the entrance to Hsiang Hai.

The village of Pei-chieh consists of the Custom house, a railway wharf where deep-draught vessels berth, a few shops and residencies; on a hill behind the village is the prominent residence of the Commissioner of Customs. In 1937, there were four wharves. All vessels arriving at or leaving Chiang-men must stop off the Custom house.

Pei-chieh is connected to Chiang-men by railway.

The maximum draught of vessels able to reach Pei-chieh in 1946 was 8 feet (2m4).

Tidal streams.—The out-going tidal stream off Pei-chieh (*Lat. 22° 36′ N., Long. 113° 07′ E.*) attains a rate of from 4 to 5 knots during the high-river season, and from one to 2 knots during the low-river season.

Chiang-men.—The city of Chiang-men (Kongmoon) is connected to the general telegraph system. It is the terminus of the Sunning railway, which connects it with the coast northward of Tongkwa.

There is frequent communication by steamer with Hong Kong and Macao.

Supplies.—The foreign community depends entirely on Hong Kong for all supplies, but poultry, bread, vegetables and fruit are obtainable locally.

Trade.—The chief exports are palm leaves and fans, silk, soy, sugar cane, black tea, tobacco, oranges, &c.

Main river.—Gruning shoal to Chi tau shan.—The entrance to Chau lin channel, which forms part of the main channel of the Hsi chiang, is described on page 533. About half a mile north-westward of the entrance is the south-eastern end of an island, separated from Chau lin by a narrow creek; a shoal, with a depth of 4 feet (1m2) over it, lies off this end of the island, almost in mid-channel.

A sunken stone barrier, nearly awash at low water, extends 1½ cables eastward from the north-western end of the island, and is usually marked by eddies. A bank, with a depth of 3 feet (0m9) over it, extends a short distance from the south-western side of the river, close north-westward of the barrier, and there is a depth of 8 feet (2m4) in mid-channel between this bank and the opposite bank.

On the north-eastern side of the south-eastern entrance of Chau lin channel, an island lies close off the south-eastern side of Futong, separated by a creek which leads northward into Sandpiper creek.

Charts 2562, 2661a, 1263.

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Chart 3588.

Bamboo island, which is low and flat, lies in mid-channel about three-quarters of a mile eastward of Hall point, the north-western extremity of Chau lin. Vessels should pass between Bamboo island and Chau lin, where it is clear except for some rocks on the Chau lin side which do not constitute a danger.

An overhead cable crosses the river at Bamboo island.

A spit, with a depth of 4 feet (1m2) over it, extends 3 cables northward from Hall point. Vessels proceeding from Chau lin channel to Pei-chieh by its northern approach should round Hall point at a distance of about 4 cables.

There is a stone pier on the western side of this part of the river at the foot of a high wooded hill, about half a mile south-westward of Hall point, and two piers on the eastern side abreast it. About one mile southward of Hall point there is a rock, which dries 2 feet (0m6), close off the eastern bank, and another rock, which dries 5 feet (1m5), close off the western bank, about 3 cables south-westward.

Chau kwan, a village, off which there is a rocky spit, stands on the western bank of the main river, about one mile north-north-westward of Hall point. Another rocky spit projects from the eastern bank about one mile above Chau kwan, and a bank extends offshore at Pak tang, a village, situated at the north-western end of Futong.

A sand spit, which covers at high water, extends about three-quarters of a cable offshore between Pak tang and the southern entrance point of the north-western end of Sandpiper creek, about 3 cables northward.

Chi tau shan, or Plover island (*Lat. 22° 42′ N., Long. 113° 06′ E.*) lies in mid-river about three-quarters of a mile north-north-westward of Pak tang. This island is low and flat, except for a rocky mound, about 40 feet (12m2) high, at its northern end; a prominent house stands on the mound. Chi tau shan is a military station, and an overhead telegraph cable, indicated on the chart, crosses the river here to the eastern bank, which is low. In 1932, the cable had an elevation of 75 feet (22m9) above water during low river; passing under it, vessels should keep close to the eastern bank where there is ample depth.

The channel eastward of the island, which is clear and deep, should be used. There are reported to be rocks in the channel westward of the island.

Sandpiper creek.—Dangers.—Sandpiper creek is about 8 miles long from its southern entrance (page 533) to where it rejoins the main river, below Chi tau shan. The town of Ku-Chen hsu (Kuchan) is situated near the eastern bank, close northward of Wu chun hill; the village of Ts'ao-pu (Hoi chau), which can be identified by a low bare hill immediately behind it, stands on the same side about 2½ miles farther northward; and the village of San hui stands on the northern bank close within the northern entrance.

Sunken groynes extend about half a cable from the eastern bank westward of Wu chun hill. A bar, with depths of from 3 to 4 feet (0m9 to 1m2) over it, lies across the creek about 1½ miles northward of the southern entrance.

Sheung lung rock, with a depth of one foot (0m3) over it, lies in mid-river off the stone landing steps at Ts'ao-pu. The passage is westward of this rock.

Charts 2562, 2661a, 1263.

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Chart 3588.

Sandpiper rock, nearly awash, and with deep water close to it, lies near the north-eastern bank, about 2¾ miles north-westward of Ts'ao-pu; when the stream is strong, this rock is marked by eddies.

About one mile eastward of San hui, a large groyne extends from the northern bank and a bank extends from the southern bank more than half way across the creek. A reef, with a depth of 3 feet (0m9) over its outer end, extends nearly half a cable north-westward from the southern bank across the north-western end of the creek. A strong stream runs across the mouth of the creek, which must be allowed for when entering the main river.

Main river.—Chi tau shan to Fa chiau.—Light.—Between Chi tau shan (*Lat. 22° 42′ N., Long. 113° 06′ E.*) and Staunch island, 3 miles north-north-westward, the river widens. The village of Heng-chiang (Wongkong) stands about half a mile westward of Chi tau shan, a short distance inland.

Sam niong miu, a temple, stands on the western bank, about one mile north-north-westward of Chi tau shan, and close southward of a rocky point. A rock, which dries 6 feet (1m8), lies close off the western bank half a mile southward of Sam niong miu, and a rock, which dries 8 feet (2m4), lies close off the same bank, a quarter of a mile northward of the temple. Short groynes extend from the western bank all the way up this reach of the river.

There is a channel along the eastern shore which is used by shallow-draught vessels during the low-river season.

Staunch island consists of a rocky patch, which covers when the river is 10 feet (3m0) above zero at Chiang-men; a ledge extends a quarter of a mile northward from the island.

A light is exhibited, at an elevation of 28 feet (8m5), from a mast surmounted by a ball, on a white hut erected on piles, situated on Staunch island.

Lo sa tau point, which is low, lies about half a mile eastward of Staunch island; a bank, which dries, extends a short distance northward and westward from this point.

Between Lo sa tau point and First cliffs, which are 170 feet (51m8) high, about 8 cables north-eastward, is the entrance to a branch of the river which runs in a south-easterly direction for about 3 miles, where it is joined by the northern end of Lung kong creek (page 532) and by other channels which are connected with the Chu chiang system. A bank, with depths of 6 feet (1m8) over it, extends from Lo sa tau point nearly half way across the entrance to this branch.

Fa chiau, an island, 120 feet (36m6) high, lies about 2½ miles northward of Staunch island, with navigable channels on both sides of it. A rock, with a depth of less than 6 feet (1m8) over it, lies close westward of the southern extremity of Fa chiau, and a spit extends nearly half a mile from the north-western extremity of the island; with these exceptions, the main channel, westward of the island, is clear of dangers. Eastward of Fa chiau, the Hsi chiang is joined by Kum chuk creek, which connects it with the Chu chiang system.

A high overhead telegraph cable crosses the river about half a mile southward of Fa chiau.

The channel eastward of Fa chiau is narrow but deep; vessels using it should keep close to the island to avoid being set into the

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Chart 3588.

rapids which exist at the entrance to Kum chuk creek, and should guard against cross currents, especially at the northern end of the channel.

Chart 2734.

Main river.—Fa chiau to Chin-sha.—Tam kong chau, or Opossum island, lies in mid-river about one mile west-north-westward of Fa chiau (*Lat. 22° 48′ N., Long. 113° 04′ E.*); the channel lies northward of Tam kong chau and past Kaukong sa hau, that part of the town of Kaukong hu, the principal town of the district of Nam hoi, situated on the northern bank abreast the island. This town is in regular steamer communication with Hong Kong.

Pratt point, the eastern extremity of the eastern of the two Hok shan islands, lies about three-quarters of a mile westward of Tam kong chau; these islands are low and flat, and separated by a narrow channel, the greater part of which dries. The main channel lies between the Hok shan islands and an extensive bank which extends from the north-eastern bank of the river. Perkins rock, with a depth of 6 feet (1^{m}8) over it, is situated on the southern end of this bank, 2 cables off the eastern of the two Hok shan islands and is occasionally marked by faint ripples. There is a channel for small craft close to the north-eastern bank which is much used by tows.

Ku lo, a village on the south-western bank of the river, where there is a passenger landing stage, is situated about 1½ miles west-north-westward of the western Hok shan island; a ledge of rocks, partly above-water, the outer edge of which is usually marked by eddies, extends off Ku lo nearly into mid-river.

Ho ching, a village where there is a ferry, lies on the north-eastern bank abreast Ku lo.

About one mile above Ku lo, and abreast a ruined pagoda on the eastern bank, the river trends northward. There is anchorage, abreast a small rest house, about one mile above Ku lo, in depths of from 7 to 9 fathoms (12^{m}8 to 16^{m}5). A seven-storied pagoda, 187 feet (57^{m}0) high, and visible from a considerable distance both up and down the river, is situated on a point on the western bank about 3¾ miles north-north-westward of Ku lo; the village of Samchau lies about half a mile south-westward of this pagoda. Good anchorage can be obtained, in a depth of 16 feet (4^{m}9), off the seven-storied pagoda at the entrance to the channel westward of Tai ping chau; in the low-river season the flood stream is felt slightly here. Duck abound here during the winter months.

Just above the seven-storied pagoda the river is divided by Tai ping chau, which is low, flat, and partly wooded; an extensive sand-bank extends from Harrison point, the northern end of the island. Rattler island, also low and flat, lies between the south-eastern end of Tai ping chau and the eastern bank; a sandspit, which dries at low river, extends northward and eastward from the northern end of this island.

There is a channel on each side of Tai ping chau; that westward of the island is not recommended, being shallow at each end. The channel on the eastern side is the main channel, the greatest depth being found on its eastern side.

The village of Tai ping hu stands on the eastern bank abreast Tai ping chau. A black three-storied pagoda, 105 feet (32^{m}0) high,

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Chart 2734.

with white bands, stands on the western bank about one mile south-westward of Harrison point.

Ho kok island lies close off the eastern bank about 1¼ miles northward of Harrison point. Red hills, 585 feet (178m3) high, are situated a short distance inland from the western bank abreast Ho kok island. Between Harrison point and Rocky point, on the eastern bank about 4½ miles north-north-westward, the river is clear of dangers except those close inshore indicated on the chart. Rocky point (*Lat. 23° 00′ N., Long. 112° 51′ E.*) is steep-to and clear of danger, but the point on the opposite bank, on which is situated the village of Fu wan, has rocks off-lying it, and the bight in the western bank farther northward is shallow.

Sik lung tsi, or Campbell island, 60 feet (18m3) high, and steep-to, lies in mid-river about 2 miles northward of Rocky point; the passage eastward of the island is clear, and that westward of it is also clear except for a rock, which dries 12 feet (3m7), lying close northward of a seven-storied pagoda on the western bank abreast Sik lung tsi. This reach of the river, as far as about one mile northward of Sik lung tsi, is lined with brick kilns on both sides.

Pak nai bank, which dries at low river, lies near the eastern shore about 1¾ miles above Sik lung tsi; this bank is steep-to on its western side, with deep water in the fairway of the channel. A bank extends from the eastern side of the river north-westward of Pak nai bank for a considerable distance and restricts the width of the navigable channel in this reach. Just above Pak nai bank the river trends north-north-westward round a low point, on the western side, on which is an inconspicuous temple, and which is fringed with drying rocks usually marked by eddies. The entrance to Chin li creek lies a short distance northward of this point.

About 2 miles farther northward, near the village of Ma hau on the eastern bank, the river contracts and flows between rocky headlands where the depths are considerable, subsequently widening again. About 2 miles northward of Ma hau, Chin-sha (Kwong sai, or Fort island) lies a short distance off the north-eastern bank. Chin-sha is flat, low, and partly wooded. The main channel is westward of it; the channel on the eastern side is narrow owing to a shoal which extends from the eastern and north-eastern sides of the island. A spit extends about a quarter of a mile from the north-western end of the island. A rock, with a depth of about 4 feet (1m2) over it, was reported, in 1937, to lie about 30 yards (27m4) off the bank, about the middle of the western side of Chin-sha.

Close south-eastward of Chin-sha is the entrance to San-shui junction (page 527).

Mandarin shoal, which lies off the entrance to San-shui junction, varies annually in size and position. In some low-river seasons it does not exist, in others it does not constitute a danger. When dangerous it is usually marked by a sampan displaying a red flag.

Light.—A light is exhibited, at an elevation of 30 feet (9m1), from a white mast, 19 feet (5m8) in height, and surmounted by a white sphere, situated on the western bank about 3½ cables south-eastward of the entrance to Chin li creek.

Ching ki creek.—Ching ki creek joins the Hsi chiang from northward about half a mile north-westward of Chin-sha. The village of

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Chart 2734.

Ch'ing-ch'i-hsü (Ching ki) stands on the eastern side of the entrance. This creek connects the Hsi chiang with the Sui chiang (page 572), a branch of the Pei chiang. H.M.S. *Sandpiper*, in July, 1909, when neither the Sui chiang nor the Hsi chiang were particularly high, ascended this creek without difficulty to Au ti, a distance of about 6 miles, but, above that village, to the junction with the Sui chiang, a further distance of about 6 miles, the creek can only be navigated during summer freshets.

H.M.S. *Robin* passed through this creek in June, 1913, the water-level at San-shui being 11 feet (3m4) above zero, and gives the following directions for the passage from Au ti to the Sui chiang. Above Au ti the river is slightly shallower than below, and a bar is reached 2 miles below the junction with the Sui chiang, the best water being close to the southern bank. There are apparently no dangers to navigation except sandbanks, for which the sounding pole is the only guide.

Between Ch'ing-ch'i-hsü (*Lat. 23° 11' N., Long. 112° 47' E.*) and Au ti the creek flows through flat country and is embanked to prevent floods; the width varies from 60 to 100 yards (54m9 to 91m4), and the channel is obstructed by many sandbanks; a depth of 3 feet (0m9) was found off Au ti. Ta-sha-hsü (Tai sha) is a large village on the western bank, about one mile below Au ti.

Main river.—Chin-sha to Kao-yao.—From Chin-sha the Hsi ching runs westward for about 7 miles to Mo-yen chou (Kwangli island). Poi sui, a village, stands on the northern bank about one mile westward of the entrance to Ching ki creek. Red and Kestrel banks extend a considerable distance from the southern bank opposite Poi sui and there is a patch of rocks, which dry, close eastward of Red banks. Wing on, a village, is situated on the northern bank 3 miles westward of Poi sui, and the village of Sha po stands on the southern bank about half a mile farther westward.

The banks on both sides of the river in the vicinity of Sha po are steep-to and a vessel can anchor close inshore. Mo-yen chou has a channel on each side of it; the channel southward of the island is shallow and only suitable for use during the high-river season; the northern channel is clear except for some rocky patches, close inshore, near Chaong lai cheong, a village on the northern bank abreast the eastern end of the island. As sandbanks extend off the northern side and western end of Mo-yen chou, the navigable channel is nearer the northern bank. A spit extends about 6 cables west-south-westward from the western end of the island.

From Mo-yen chou the river trends south-westward towards Ling yang gorge. The town of T'ao-ch'i (Tau kai) stands on the south-eastern bank, about 1½ miles above Mo-yen chou. Abreast T'ao-ch'i, where the river is wide, is First bar, with a depth of 6 feet (1m8) over it, at low river. The village of Howlik stands on the western bank about one mile above T'ao-ch'i.

Ling yang gorge, where the river flows through mountain ranges which rise to an elevation of 2,814 feet (857m7) in Mount Parkes on the eastern side, is entered about one mile southward of Howlik. This pass is nearly straight, and in its narrowest part from one to 1½ cables wide; the greatest depth in the pass is 30 fathoms (54m9) at its northern end. Overhead telegraph cables span the river at both ends

Charts 2562, 2661a, 1263.

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Chart 2734.

of the gorge. There is a pagoda on the western bank at the southern end of the gorge, and Lung wa joss house stands on the eastern bank abreast it. There are rocks close off this joss house, and also off the village of Tak hau, on the eastern bank, about one mile southward.

From half a mile southward of the last-mentioned pagoda as far as the pagoda standing close eastward of the village of Wong kong sha, about 3 miles south-westward, a sandbank extends a considerable distance from the western bank; the city of Kao-yao (Shiuhing) (*Lat. 23° 01′ N., Long. 112° 28′ E.*) stands on the northern bank about 2 miles westward of Wong kong sha. Some rocks lie close off a large pagoda situated on the northern bank midway between Wong kong sha and Kao-yao. The river at Kao-yao is over one mile wide; a sandbank, awash at low river, which was reported, in 1909, to be extending northward, encumbers the southern side of the river from abreast the city for about 3 miles eastward.

There is good anchorage off the southern gates of Kao-yao, about half a mile above the main steps.

It is reported that the water, when in flood, rises about 40 feet (12^{m}2) above winter level, and to reach the roofs of the houses on the bank and even the city gates. The tidal influence is felt at Kao-yao; there is a rise and fall of 3 feet (0^{m}9) or more in February, but the river stream, though completely checked by the flood tidal stream, does not turn.

Kao-yao.—Kao-yao (Shiuhing), a walled city and a military station, with an extensive suburb, is surrounded by hills and waterways. The city is connected to the general telegraph system. It exports straw mats and bags; carved steatite ware is a local industry. There are some mission stations here.

Main river.—Kao-yao to Kai kwan shek.—For about 24 miles above Kao-yao the river winds through hilly country, opening out again near Narrow island, which appears to lie in the middle of the river, covered with bamboos, but is connected with the northern bank by extensive sandbanks. The hills, varying from 100 to 1,500 feet (30^{m}5 to 457^{m}2) high, are, in general, densely wooded, and many of them are cultivated. Occasional rugged hills of marble are seen; a marble range, named The Seven Stars, is situated about 2 miles northward of Kao-yao, and a marble hill, called The Cock's Comb, which it resembles, lies near the northern bank, about 8 miles westward of Narrow island.

The villages of Lu-pu-hsü (Lukpo), 16 miles above Kao-yao, and Yüeh-ch'eng (Yutshing), 12 miles farther up, are open to trade.

About one mile westward of Kao-yao, there is a salt station on the northern bank, abreast which a rock lies close off the southern bank. Spike hill lies on the northern bank about 1¼ miles westward of the salt station, and Tai ting temple stands on the southern bank opposite Spike hill.

Overhead telegraph cables span the river at Spike hill, necessitating keeping very close to the northern bank during the high-river season.

There is a prominent white house at Fu wan, a village on the western bank, about three-quarters of a mile north-westward of Tai ting temple; a bank extends from the eastern side of the river just above Fu wan. At Tai wan, a village on the western bank, about 2 miles northward of Fu wan, there is a sandy beach.

Charts 2661a, 1263.

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Chart 2734.

Siu siang gorge, which is deep and steep-to, is entered about 2½ miles north-north-eastward of Tai wan. Lo kong joss house stands on the eastern bank at the northern end of this gorge about 3 miles north-north-eastward of Tai wan; some rocks lie close off the south-western bank abreast this joss house. Ta-hsiang-k'ou (Tai siang), a village, off which a sandbank extends a short distance, stands on the northern bank, about one mile west-north-westward of Lo kong joss house. A conspicuous tower stands on a hill, on the northern bank, about one mile westward of Ta-hsiang-k'ou.

Wa kong joss house, a small stone shelter, stands on the eastern bank about 2 miles west-north-westward of Ta-hsiang-k'ou; just above this joss house, on the western side of the river, there is a rocky ledge which is covered during the high-river season.

The village of Lu-pu-hsü (Lukpo) (*Lat. 23° 08′ N., Long. 112° 28′ E.*) stands on the northern bank about 4 miles west-north-westward of Wa kong joss house. Abreast Lu-pu-hsü a bank extends from the south-eastern side of the river; a bank extends a short distance from the western shore about 2 miles southward of Lu-pu-hsü. Sheong tau yao, a village, stands on the southern bank about 3½ miles south-south-westward of Lu-pu-hsü; there are small banks extending from the southern side of the river just westward of Sheong tau yao and another extending from the northern side just eastward of it. Shek lung, a village with a rock close off it, stands on the north-western bank, about 1½ miles westward of Sheong tau yao.

Tree head lies on the south-eastern bank, about 3 miles south-south-westward of Shek lung; about one mile northward of Tree head, there is a steep projection from the eastern bank. Narrow island lies in mid-river northward of Tree head. Sandbanks, which are steep-to on their southern side, extend 1½ miles west-south-westward from Narrow island; these banks are usually marked by stakes.

A short distance westward of Tree head, there are three prominent red cliffs, with some dangerous rocks, marked by swirls, extending a considerable distance from the southern bank abreast the second red cliff.

Yüeh-ch'eng (Yutshing) (*Lat. 23° 04′ N., Long. 112° 09′ E.*) stands on the north-western side of a bend in the river, about 3½ miles westward of Narrow island. Hsia-chiang-shui (Kong sui), a village, close off which are some rocks, stands on the southern side opposite Yüeh-ch'eng. A bank extends from the southern side just westward of Hsia-chiang-shui, and another bank extends from a point about one mile farther west-north-westward.

Sheong sia wan, a village, stands on the northern bank, about three-quarters of a mile westward of the last-mentioned point. A bank extends from the northern shore near Sheong sia wan and some rocks lie close off the southern bank opposite this village. Chowsun, a village off which there is a bank, reported, in 1936, to be wider than indicated on the chart, stands on the northern bank, 2 miles westward of Sheong sia wan. Kai kwan shek stands on the northern bank, about three-quarters of a mile westward of Chowsun; a rock lies close off Kai kwan shek.

Chart 2735.

Main river.—Kai kwan shek to Ts'ang-wu.—Buoys.—Lük tau, or The Deer's head, a promontory, juts out from the southern bank about half a mile westward of Kai kwan shek. A rock, the

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Chart 2735.

existence of which is doubtful, is charted on the southern side of a bank which extends from the northern shore, about 1¼ miles westward of Lük tau. A rock, which dries 2 feet (0m6), lies close off a hill, 210 feet (64m0) high, situated on the eastern bank, about 1¼ miles farther north-westward.

Chiu-kuan-hsü (Kau koan), a village in which there is a prominent white house, stands on the north-eastern side of a bend in the river about 1½ miles northward of the 210-foot (64m0) high hill. A rock, with a depth of 4 feet (1m2) over it, known as Cicala reef and sometimes marked by a buoy, lies off a hill, 450 feet (137m2) high, on the eastern bank, about half a mile southward of Chiu-kuan-hsü. A rock, which dries 4 feet (1m2), lies between Cicala reef and the eastern bank, and there is another rock, close off the same bank, a short distance northward. Luttow bank dries from 10 to 15 feet (3m0 to 4m6), and the extent of which can best be seen on the chart, fringes the western bank opposite Chiu-kuan-hsü. Luttow bank is steep-to except at its northern end.

Chiu-kuan (Kau koan) bank extends a short distance from the northern bank from 1¼ to 3 miles westward of Chiu-kuan hsü (*Lat. 23° 06′ N., Long. 112° 01′ E.*).

Ou-t'ang (Chut polim), a village, stands on the southern bank, 5½ miles westward of Chiu-kuan-hsü; Kong shui bank extends a short distance offshore eastward of this village. The mouth of the Ma hu river is situated on the northern side of the river abreast Ou-t'ang; banks extend from the northern side on both sides of this mouth. A pagoda, with 9 stories, stands on the northern bank about 2¼ miles westward of the mouth of the Ma hu.

The mouth of the Nam chiang is situated on the southern side abreast the 9-storied pagoda. Lo ting hau, a port of call, stands on the western side of the mouth of Nam chiang. A bank was reported, in 1936, to extend off the southern shore between a point close westward of the mouth of the Nam chiang and a point about 1½ miles eastward of the mouth.

Chart 2735, plan of Takhing.

Te-ch'ing (Takhing), a walled city, is situated on the northern bank, about 3 miles westward of the mouth of the Nam chiang. A bank, with depths of less than 3 fathoms (5m5) over it, extends southward of the city nearly half way across the river.

There is a mission station, and a hospital at Te-ch'ing.

The city is connected to the general telegraph system.

Provisions are scarce.

Chart 2735.

At Steep point, on the southern bank about 2½ miles westward of Te-ch'ing, the river turns sharply south-westward. Flat rocks, which dry one foot (0m3), extend from the north-western bank opposite Steep point, nearly into mid-river. There are strong eddies in this reach at high water.

Yung tong, a village, stands on the northern bank about one mile north-westward of Steep point. There are some rocks, which dry, and which are marked by a buoy in winter, close off the southern bank, about 6 cables south-westward of Yung tong. A bank, composed of stones and shingle, fringes the northern bank from three-quarters of a mile to about 1¾ miles westward of Yung tong.

Charts 2661a, 1263.

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Chart 2735.

Ta-li-k'ou (Tai lik hau), a village, stands on the southern bank about 2 miles west-south-westward of Yung tong. Ta-li-k'ou (Tai lik hau) bank extends from the south-western side of the river between Ta-li-k'ou and a point about 2½ miles north-westward; the south-eastern part of this bank extends more than half way across the river.

Rocky spit is situated on the north-eastern bank, 1½ miles above Ta-li-k'ou. There is a rock, marked by a buoy in winter, in midstream off Rocky spit, the channel lying between the rock and the spit. Two rocks, the existence of which is doubtful, are charted a short distance above this rock. There are considerable eddies in the vicinity of these rocks.

Ha lok, a village, is situated on the northern bank, about 1¼ miles north-north-westward of Rocky spit. Lok shui bank, the extent of which can best be seen on the chart, extends off the northern shore westward of Ha lok.

Sheong ti temple stands on the southern bank about one mile west-south-westward of Ha lok. Sandpiper reef, which dries 2 feet (0m6), extends about three-quarters of a cable from the southern bank, about one mile westward of Sheong ti temple; other rocks lie off the southern bank between the temple and the reef.

Lo-p'ang (Lu pong), a village, stands on the southern bank about 2 miles westward of Sheong ti temple. Fa piu rocks, which dry 14 feet (4m3), lie in mid-stream northward of Lo-p'ang (*Lat. 23° 10′ N., Long. 111° 37′ E.*), the channel being between them and the southern bank of the river. Some rocks, the existence of which is doubtful, are charted half a mile north-westward of Fa piu rocks, on the edge of the bank extending from the north-eastern shore.

A short distance inland from the northern bank, north-eastward of Fa piu rocks, a single mass of granite, in the form of a thumb, rises perpendicularly, about 300 feet (91m4), on a range of hills, 1,410 feet (429m8) high. Its local name is Kum kwo shek, but it is also called Fa piu, or The Monk's Head, and is very remarkable.

A rock lies close off the south-western bank about 1¾ miles north-westward of Lo-p'ang.

Sun sin kiu, or The Fairies Bridge, a reef with rocks northward of it, extends from Tuching bank, situated on the eastern side of the river, about 3¾ miles north-westward of Lo-p'ang. Sun sin kiu extends nearly to the opposite bank; its western extremity is marked by a buoy, and there are rocks close off the western bank abreast it; the channel is between these rocks and the western extremity of this reef.

Tu-ch'eng (Dosing), on the western bank, close above Sun sin kiu, is a large town and is open to trade. An overhead telegraph cable spans the river three-quarters of a mile above Tu-ch'eng, which can be cleared by keeping close to the eastern bank. Pa chung bank, the northern part of which is named Tu lok spit, extends a considerable distance from the north-western bank immediately above Tu-ch'eng. The south-eastern side of this bank is marked by buoys. The village of Ku-hsün (Pa chung), with a joss house close south-westward of it, stands on the south-eastern bank about one mile eastward of Tu-ch'eng. There are rocks close off the south-eastern bank about 4 cables above Ku-hsün.

Tu lo (Tu lok heu), an inconspicuous village, stands on the eastern bank abreast Tu lok spit. Some rocks, which dry 6 feet (1m8), lie close

Charts 2661a, 1263.

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Chart 2735.

offshore a short distance northward of Tu lo. Landslip hill lies on the western bank abreast these rocks. Ch'ang-kang hsü (Chongkong) stands on the eastern bank about 1¼ miles northward of Tu lo. Red hill bank extends from the north-eastern side of the river both abreast and for some distance northward of Ch'ang-kang hsü.

Kupi joss house, which cannot be seen when heading up river until nearly abeam, but is marked by a hill on which is a solitary tree, stands near the south-western bank, about 3 miles above Ch'ang-kang hsü. There are bamboos in front of Kupi joss house; Bullock rock, which is unnoticeable, lies close offshore south-eastward of this joss house.

Second bar is abreast Kupi joss house; there is reported to be a least depth of 6 feet (1m8) over this bar; the channel across it is also reported to shift. Kok heu banks extend about 5 miles along the north-eastern bank of the river above Second bar.

Robinson rocks, marked by a buoy, lie on the western side of the channel, nearly in mid-river, about 1¼ miles above Kupi joss house, and Janus rock, also marked by a buoy, lies in a similar position about one mile farther up the river. Webster rocks lie close off the western bank about 3¼ miles north-westward of Kupi joss house. A sunken rock, known as Moth rock, lies about 2 cables north-north-westward of Webster rocks and over one cable off the western shore, and there is another sunken rock about 2 cables farther north-north-westward. Kok heu, a village amongst trees, stands on the north-eastern bank abreast Webster rocks. A part of Kok heu banks, which dries 12 feet (3m7), and which is separated from that extending from the north-eastern bank by a boat channel, extends half way across the river abreast this village.

Feng-ch'uan (Fungtsun) (*Lat. 23° 24′ N., Long. 111° 31′ E.*), a walled city, is situated on the eastern bank about 3½ miles north-north-westward of Kok heu; Feng-ch'uan (Fungstun) bank extends into mid-river abreast the city.

Tu hau tsui, a village, stands on the western bank abreast the northern end of Feng-ch'uan bank. Yen ting kok, a village, with a joss house, is situated on the eastern bank about one mile northward of Feng-ch'uan.

Ho chiang (Kai river) (page 548), a tributary, joins the Hsi chiang on its eastern side about 2 miles northward of Feng-ch'uan. Chiang-k'ou-hsü (Kong hau), an important village, stands on the western side of the mouth of the Ho chiang.

Chiang-k'ou (Kong hau) banks extend off the western side of the Hsi chiang between Tu hau tsui and a point about 2¼ miles northward; a rocky ledge lies off the eastern bank a short distance northward of the mouth of Ho chiang.

Sheong yu, or Twin rocks, which dry 7 feet (2m1), and when submerged may be marked by ripples, lie nearly in mid-stream, and on the northern side of the channel, about 2½ miles north-westward of the entrance to Ho chiang. The village of Tai wang, close westward of which a sandbank extends almost into mid-river, stands on the northern bank, northward of Sheong yu.

Between Tai wang and Ts'ang-wu, on the northern bank, about 8 miles westward, there are several rocks, which are marked by buoys according to the system described below.

Charts 2661a, 1263.

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Chart 2735, plan of Wuchow.

Kilong islet, or Chicken Basket, 20 feet (6^{m}1) high, on which there is a joss house, lies on the southern side of the fairway, about 1½ miles below Ts'ang-wu. Rocks, some of which dry 9 feet (2^{m}7), extend 3 cables westward from Kilong islet, and a rock, which dries 48 feet (14^{m}6), lies on the end of a drying bank which extends about 2 cables eastward from the same islet; close eastward of this rock is another islet.

A reef, which dries 11 feet (3^{m}4), extends a short distance from the southern bank of the river about 1¼ miles westward of Kilong islet.

Chart 2735.

Buoyage.—Depths.—From Tu-ch'eng to Ts'ang-wu many of the dangers are marked by spar buoys either on the danger itself or very near it, and by more conspicuous wooden triangular framework buoys near the spar buoys. The triangular buoys are sometimes swept away by tows, &c., but the spar buoys usually remain in position. The triangular buoys are placed in position by the Harbour Master at Ts'ang-wu when the water level is about 7 feet (2^{m}1) at Ts'ang-wu. These buoys are numbered from No. 1, off Sun sin kiu, to No. 14, in the Ts'ang-wu reach. Red buoys should be left on the starboard hand, and black buoys on the port hand, when proceeding up river.

With the water level at Ts'ang-wu showing 1¼ feet (0^{m}4), there was a least depth of 9 feet (2^{m}7) in the fairway of the channel between Tu-ch'eng and Ts'ang-wu in February, 1934.

Chart 2735, plan of Wuchow.

Ts'ang-wu. — Tide-gauges. — Telegraph cables. — The city of Ts'ang-wu (Wuchow) stands close within the boundary of Kwangsi and about 180 miles from the sea. The Kuei chiang (Kwei kiang) flows into the Hsi chiang from northward close westward of Ts'ang-wu.

The city (*Lat. 23° 29′ N., Long. 111° 16′ E.*) stands on the south-western side of a hill which rises to an elevation of 1,200 feet (365^{m}8). The business quarter is in the south-western part of the city. The Commissioner's house stands in the foreign compound, situated eastward of the city. Some conspicuous barracks stand about 1½ cables north-westward of the Commissioner's house, and there are some radio masts a short distance northward of the barracks.

There are some missions and two hospitals in the city.

A Customs pai, where there is a tide-gauge, is situated on the northern side of the river, a quarter of a mile south-westward of the Commissioner's house, and several buildings are situated from one to 3¼ cables westward of the Customs pai.

Overhead telegraph cables, indicated on the chart, span the river close eastward of the foreign compound: these cables are low and necessitate housing the topmasts and keeping close to the northern bank during the high-river season.

On the southern bank of the river, opposite the foreign compound, and about 6 cables southward of the Commissioner's house, there is a prominent pagoda standing on a hill, 490 feet (149^{m}3) high. There are also some oil installations and a tide-gauge on this side. The hills on the southern side rise to an elevation of 850 feet (259^{m}1).

The old British consulate, now occupied by missionaries, is situated on the western bank of the Kuei chiang, opposite Ts'ang-wu, and there is a prominent brick building one mile westward of it.

Charts 2661a, 1263.

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Chart 2735, plan of Wuchow.

The northern bank of the Hsi chiang, at Ts'ang-wu, slopes, and, in summer, when the river overflows this bank, the river is considerably wider opposite the city than it is in winter.

Ts'ang-wu can be reached by vessels with a draught of 13 feet (4m0) at high river, and from 6 to 7 feet (1m8 to 2m1) at low river. *Chart 2735.*

Current.—The rate of the stream during high flood in the gorge is from 5 to 8 knots, with bad swirls; the average rate in winter is 1¼ knots.

River level.—The rise of the Hsi chiang is irregular. In 1897, the lowest water was taken as a datum for the zero mark at Ts'ang-wu; since that time the river has fallen 2 feet 10 inches (0m9) below the datum and risen 68 feet (20m7) above it, so at the time of low river, vessels drawing over 7 feet (2m1) run the risk of grounding in several places in the river. *See* diagram of average daily water-levels at San-shui, Ts'ang-wu and Yung-ning, facing this page.

The period of low river appears to last from the beginning of December to the middle of March, after which the river rises rapidly, attaining its highest level in June, and falls again gradually from the end of September. In February, 1903, the river rose 22 feet (6m7) in 24 hours without warning. In 1904, the first rise occurred about the 24th May, and the second about the 20th June; the water level was 28 feet (8m5) above the zero at Ts'ang-wu, on the 25th May. On the 1st August, 1906, the river level was only 13 feet (4m0) above zero, but by the 17th August it had risen to 42 feet (12m8) above. During 1933, the river level varied from about 2 to 14 feet (0m6 to 4m3) in March, from about 10 to 42 feet (3m0 to 12m8) in May, and from about 22 to 58 feet (6m7 to 17m7) in June, after which it fell by gradual undulations to about 2 feet (0m6) in December.

Anchorage.—The usual anchorage is abreast the Commissioner's house, situated close eastward of the city (*Lat. 23° 29′ N., Long. 111° 20′ E.*).

H.M.S. *Moth* reported, in 1929, that in summer, when the Kuei chiang is in flood, safe anchorage may be found on the southern side of the river, opposite Ts'ang-wu.

Communication.—Supplies.—There is frequent steamer communication with Hong Kong, via San-shui, and also with Canton. A motor road connects Ts'ang-wu with Yung-ning.

Ts'ang-wu is connected by telegraph to the principal towns on the river.

Provisions, except meat, are generally plentiful.

Coal, of an inferior quality, can usually be obtained.

Fuel oil can be obtained, and it is possible for shallow-draught vessels to oil alongside a small pontoon on the southern side. *Chart 1263.*

Ho chiang.—It was reported, in 1937, that, with the river level 45 feet (13m7) at Ts'ang-wu, the Ho chiang (Kai river), which is also called the Fo kong, could probably be navigated by vessels, 237 feet (72m2) long, drawing 5 feet (1m5), as far as the village of Tun Nam, situated on the western bank about 90 miles northward of its mouth (page 546).

The Ho chiang is probably affected by the height of the water in the Hsi chiang as far as the first rapids, situated about 53 miles north-

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TS'ANG-WU,

ndicates Yung-ning Daily Water-level Averages, 1920–25 and 1932–35.

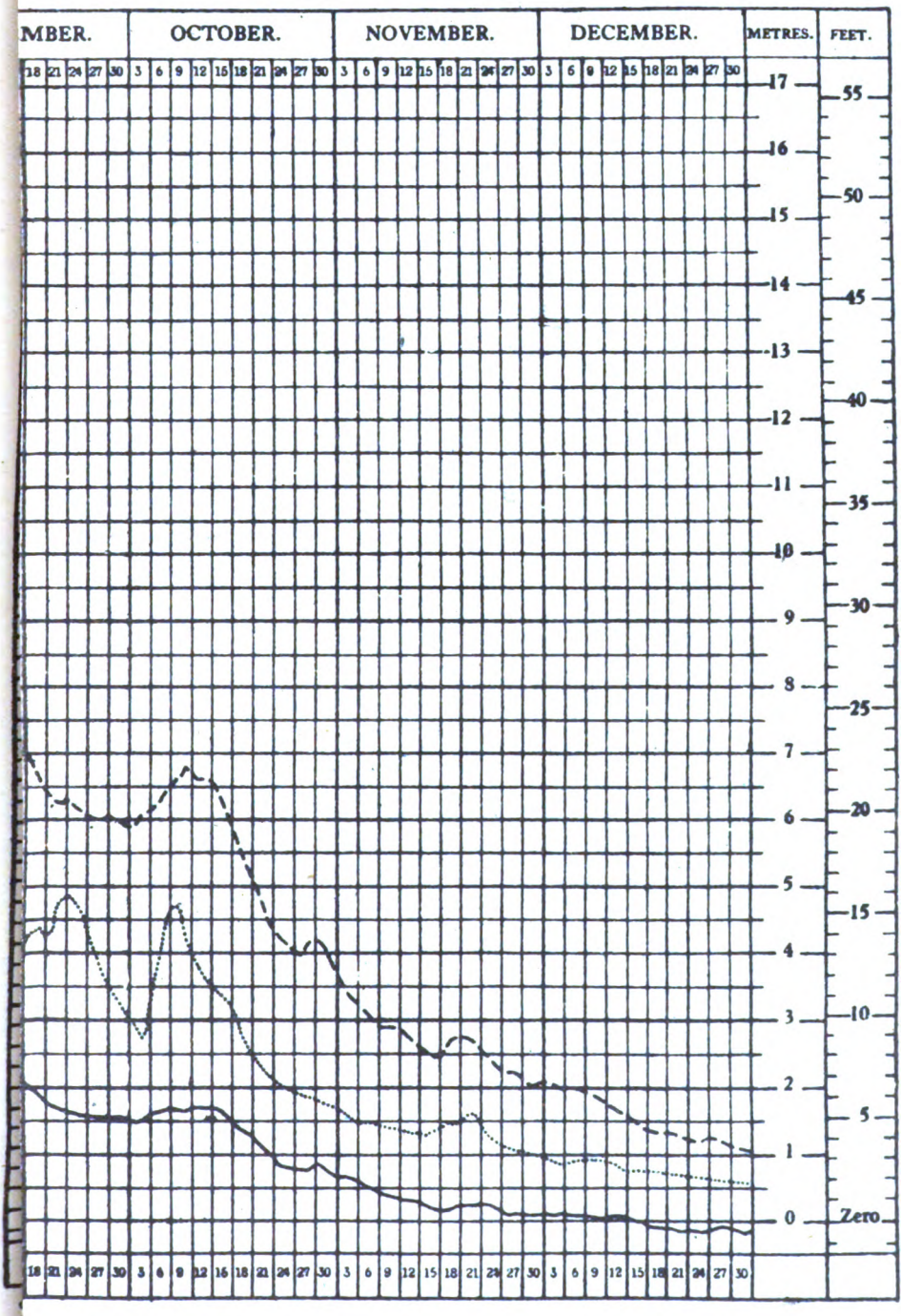

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Chart 1263.

north-eastward of Chiang-k'ou-hsü; above these rapids the river level is only affected by the rainfall up-country. The breadth of the river varies from 1½ to 2½ cables as far as Tun Nam.

The current attains a rate of about 2 knots below Hoikin, situated on the eastern bank, about 67 miles from the mouth, and rates of from 3 to 4 knots above, except in the rapids where a rate of as much as 6 knots may be experienced.

Overhead cables, which are low, cross the river at Chiang-k'ou-hsü, and again about 3 miles below Kei Shek, a village situated on the southern side of the river about 22 miles above Chiang-k'ou-hsü.

With the river level 16½ feet (5m0) at Ts'ang-wu, the least depth in the fairway of the channel was found to be 3 feet (0m9) off the village of Pak Hau, situated on the southern side of the river, about 9 miles above Kei Shek. In July, 1903, H.M.S. *Sandpiper*, drawing 2 ft. 8 ins. (0m8), proceeded about 32 miles up the Ho chiang without difficulty.

Kuei chiang.—The Kuei chiang (Kwei kiang) is navigable in the summer months as far as Pinlok (Ping lo fu) (*Lat. 24° 42′ N., Long. 110° 52′ E.*) by craft 80 feet (24m4) in length, drawing 3 ft. 8 ins. (1m1); it is reported not to be navigable in winter. The river is subject to very rapid fluctuations of level.

Junks navigate the river as far as Kweilin (Kwei ling), about 120 miles north-north-westward of Ts'ang-wu. North-eastward of Kweilin the river is connected by a canal with the Siang kiang of the province of Hunan, and thus with the Yangtze kiang.

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HSI CHIANG ABOVE TS'ANG-WU.—Above Ts'ang-wu the Hsi chiang is navigated by motor launches and large cargo boats with a draught of from 2 to 4 feet (0m6 to 1m2) as far as Yung-ning, and the Yu chiang (page 558) by smaller boats to Pai-se, an important district town in about lat. 24° N., long. 106° E.; the Li chiang (page 560) is navigable by boats to Lung-chih-hsien (page 561).

Steam navigation presents few difficulties for vessels of shallow draught as far as Kuei-p'ing (page 553), but the river level at Ts'ang-wu should be more than 20 feet (6m1) for this passage. Above Kuei-p'ing the principal difficulty is the Great rapid (page 554); this, however, is constantly taken by heavily laden cargo boats. Navigation above Ts'ang-wu is dangerous, and is only possible with local knowledge.

The level of the river at Yung-ning varies about 24 feet (7m3) between summer and winter; there are usually three rises of over 15 feet (4m6) during the summer, but they are irregular and uncertain, occurring generally on the third day after heavy rain; *see* diagram facing page 548.

The stream attains a rate of about 2 knots at low river, and about 5 knots at high river.

From Ts'ang-wu to Ta-huang-chiang-k'ou (Tahwang), 90 miles above, the river is much encumbered with rocks, but there are good channels and no bad rapids. At Kuei-p'ing there are many banks of sand and stones, and a current with a rate of 8 knots has been experienced here in May, the rate below being about 4 knots.

Thence the channel continues good to Kuei-hsien, 59 miles by river

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Charts 1015, 2661a.

south-westward, which can be reached by launches with a draught of 5 feet (1m5) at all times of the year. From Kuei-hsien to Yung-ning there are many difficult places, the worst being the Great rapid, situated about 28 miles above Kuei-hsien, and the river is tortuous at 50 miles, and also at 10 miles, below Yung-ning. Junks have to lighten to a draught of 2½ feet (0m8) at low river. There is a great difference in the navigability of the river at low or at high river (*see* page 548), and a very great difference also in the appearance of the river banks and the rapids at these times.

At a first glance the river above Ts'ang-wu appears almost deserted; the banks are high, and the junks deeply laden, and the river is so wide that it is quite possible, from one side, not to observe boats being tracked up river on the opposite side. The shipping consists almost entirely of large junks, which on the up-river journey are hauled by trackers, and sail when the wind is favourable; on the downward journey sweeps are sometimes worked.

H.M.S. *Moorhen* ascended the Yu chiang, in 1913, as far as Napo (*Lat. 23° 30′ N., Long. 106° 21′ E.*), the height of the water at Ts'ang-wu being 27 feet 6 inches (8m4), and reported that some difficulty was experienced between Ts'ang-wu and Meng-chiang-hsü while passing through the Loan cheo tan or Chaos rapid, and as far as Meng-chiang hsü, owing to a freshet down a tributary stream which enters at Meng-chiang hsü. No further troubles were experienced, except from a freshet down the Hungshui ho, until Leikung hsü was reached, when, on anchoring, the cable parted owing to a sudden eddy catching the vessel. The only further difficulty was the second part of the Great rapid.

Navigation to Yung-ning was maintained from April to the beginning of December, 1905, by vessels drawing 4 feet (1m2); and after that, until the middle of February, 1906, by a motor launch drawing 1½ feet (0m5).

H.M.S. *Cicala* visited Yung-ning from Ts'ang-wu between the 10th and the 16th of June, 1935. During that period the water level at Ts'ang-wu was about 40 feet (12m2) above zero, and the water mark at Yung-ning ranged between 19 ft. 1 in. (5m8) and 26 ft. 9 ins. (8m1).

Yung-ning was visited by H.M.S. *Tarantula* in 1929 and 1932, the river level at Ts'ang-wu, at the time of the latter visit, being 31 feet (9m4).

The following procedure is recommended for ascending the river above Ts'ang-wu in a vessel drawing 3 feet (0m9) :—

Leave Ts'ang-wu about the beginning of June, when the water begins to rise at Yung-ning, and anchor at Kuei-hsien, which is connected to the telegraph system, 166 miles above Ts'ang-wu, and there wait until the water mark at Yung-ning has risen to 13 feet (4m0).

For a vessel with a draught of 3 feet (0m9) to get up the river, a depth of 13 feet (4m0) at Yung-ning is required, and 16 feet (4m9) for coming down. Information as to the height of the water at Yung-ning may be obtained by telegraph by the courtesy of the Commissioner of Customs, Yung-ning.

The following distance table has been compiled from various authorities stationed on the river :—

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Charts 1015, 2661a.

Ts'ang wu *										
30	Teng-hsien *									
48	18	Meng-chiang								
59	29	11	Pai-ma							
78	48	30	19	P'ing-nan *						
107	77	59	48	29	Kuei-p'ing					
166	136	118	107	88	59	Kuei-hsien *				
196	166	148	137	118	89	30	Leikung hsü			
220	190	172	161	142	113	54	24	Heng-hsien		
233	203	185	174	155	126	67	37	13	Nan-hsiang-hsü	
264	234	216	205	186	157	98	68	44	31	Yung-shun *
304	274	256	245	226	197	138	108	84	71	40 Pumiao hiu
326	296	278	267	248	219	160	130	106	93	62 22 Yung-ning *

* Denotes postal telegraph stations.

Pilots.—Pilots are necessary. The pilot employed by H.M.S. *Tarantula*, in 1932, was obtained from the Asiatic Petroleum Company.

There is a pilots' guild at Ts'ang-wu to which all the pilots on the river between Ts'ang-wu and Yung-ning belong. This guild has the power of refusing a pilot to any vessel.

If ascending to Pai-se or Lung-chih-hsien additional pilots must be engaged at Yung-ning for those places; they can be obtained at Yung-ning. If proceeding to Ma-p'ing a pilot must be obtained at Ts'ang-wu.

Chart 1015.

Ts'ang-wu to Kuei-p'ing.—From Ts'ang-wu (*Lat. 23° 29′ N., Long. 111° 20′ E.*) to P'ing-nan, 78 miles westward, the navigation of the river is extremely intricate. Most of the rocks in or near the channel are marked with cairns, some standing well out of the water, some awash, and others submerged, with dangerous swirls and eddies over them. Most of the rapids give but little trouble, with the exception of Kau wei yau tan.

H.M.S. *Tarantula* reported, in 1929, that with the topmast housed there should be no difficulty going up the river, where it is possible to hug one bank or the other. Coming down, where it is difficult to keep the vessel close to the banks in the strong current, the overhead telegraph cables in one or two places would be a definite menace at very high river, and it might be necessary to stem the current and drift down close to the bank. The necessity for doing this can best be gauged on the passage up the river.

For the first 14 miles to Yong chu tan sin, a village situated on the northern bank, the river flows between two ranges of hills, the bases of which sometimes reach the water's edge, and sometimes recede, leaving open spaces, where farmhouses or small villages stand in the midst of cultivated patches. In a few places small clearings have been made upon the hill slopes, but the hills are usually either bare or overgrown with shrubs and small trees. Clumps of bamboos grow along the river banks.

The channel is southward of Ch'ang chou (Chang cha), an island lying in mid-river about 2 miles above Ts'ang-wu; there is, however, a channel northward of this island during high-river.

It was reported by H.M.S. *Robin*, in 1935, that, with the water level at Ts'ang-wu under 20 feet (6^{m}1), there was no passage between the pinnacle rocks off Ch'ih-shui-hsu (Chechuei hiu), a village, situated on the southern bank about 4½ miles above the western end of Ch'ang chou.

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Chart 1015.

At Yong chu tan sin, the river winds between cliffs from 1,000 to 1,600 feet (304^{m}8 to 487^{m}7) high; on the summit of those on the southern bank is a prominent five-storied pagoda.

Yaucha tan, or Oil Press rapid, is situated from one to 2 miles above Yong chu tan sin.

T'eng-hsien (Tengyün) (*Lat. 23° 19′ N., Long. 110° 55′ E.*), 30 miles above Ts'ang-wu, is a district city situated on the southern bank at the mouth of the Pei-liu ho (Hwanghwa kiang); it stands in more open country, and has well-built houses and a set of stone steps leading down to the river.

An overhead telegraph cable crosses the river about 1½ miles above Pei-liu ho; the overhead clearance is about 60 feet (18^{m}3) with the Ts'ang-wu tide-gauge showing 46 feet (14^{m}0).

Teng chau, 250 feet (76^{m}2) high at its western end, and wooded, is situated in mid-stream about 2½ miles above T'eng-hsien. Loan cheo tan, or Chaos rapid, is situated close above Teng chau.

For a distance of 30 miles above T'eng-hsien, the river runs through a narrow valley; for the first 15 miles, the hills attain elevations of from 2,000 to 4,000 feet (609^{m}6 to 1,219^{m}2), but for the remaining 15 miles, they are not much above 400 feet (121^{m}9) until just beyond Pai-ma, where a bold chain trends north-westward.

Meng-chiang hsü (Mongkong), 48 miles above Ts'ang-wu, is a large village on the northern bank. The Meng chiang (Wingonchow) flows into the Hsi chiang from northward, close eastward of Meng-chiang hsü.

Kau wei yau tan, or Dog's Tail rapid, about one mile long, is situated abreast Huang tuo chau, which lies in mid-stream about 5 miles above Meng-chiang hsü; the current in this rapid attains a rate of about 8 knots, with very strong swirls, when the water level at Ts'ang-wu is 28 feet (8^{m}5) above zero. The channel passes between rocks only a few yards apart. Kau wei yau tan improves with a rise in the river.

In May, 1909, with the water level at 25 feet (7^{m}6) on the tide-gauge at Ts'ang-wu, H.M.S. *Sandpiper* avoided this rapid by proceeding between Huang tuo chau and the islet southward of it.

Pai-ma, a likin station, 11 miles above Meng-chiang hsü, is a small village on the northern bank.

Ta kio miao, or Great Tusk rapid, is about one mile below Pai-ma; the current and eddies are very strong here at high-river, but there are no eddies with the water level at 28 feet (8^{m}5) above zero at Ts'ang-wu.

Above Pai-ma the land opens out into a wide stretch of undulating country; villages are larger and more numerous in this locality, but a considerable portion of the land is uncultivated.

Mo lam hau, in which there is a prominent white joss-house, is situated on the southern bank about 4½ miles above Pai-ma. Tsien-chuei tan, or Shallow rapid, is situated nearly mid-way between Pai-ma and Mo lam hau. Kuyu tan, or Serpent rapid, is situated a short distance below Mo lam hau. Above Mo lam hau the country is more level, and navigation less intricate. The village of Kiling sin is situated on the north-eastern bank about 2 miles northward of Mo lam hau; Tan chu hiu, where there is a large brick and earthenware factory, stands on the northern bank about 1½ miles above Kiling sin.

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Chart 1015.

An overhead telegraph cable crossed the river, in 1929, about 11 miles below P'ing-nan.

P'ing-nan (Pingnamyun) is a walled district city on the northern bank, about 78 miles above Ts'ang-wu. Hides are the chief export, whilst rice and cotton piece-goods are the chief imports. There is a mission in the city.

Above P'ing-nan the river traverses a broad plain, bounded on its north-eastern side by a range of hills known as Pak shek shan.

Ku yong tan, a rapid, about 5 miles above P'ing-nan, is only a quarter of a mile long; the whirls and eddies in it are very strong, and the current attains a rate of about 9 knots when the water is 28 feet (8^m5) above zero at Ts'ang-wu. This rapid improves on the rise of the river. There is a conspicuous joss house, amongst some trees, on the northern bank at the western end of this rapid.

Ta-huang-chiang-k'ou (Tahwang) (*Lat. 23° 30′ N., Long. 110° 03′ E.*) is a large and important town on the western or left bank of the river, about 90 miles above Ts'ang-wu; it is the port of Kuei-p'ing. There is daily communication by steam launch between Ta-huang-chiang-k'ou and Ts'ang-wu.

The Tai wong kiang, connected with the Hungshui ho by a tortuous passage much frequented by small craft, flows into the Hsi chiang from westward, close southward of Ta-huang-chiang-k'ou.

The city of Kuei-p'ing (Sünchow) is situated at the south-western end of a range of bare hills, 2,000 feet (609^m6) high, and on the western bank of the Hsi chiang, about 16 miles above Ta-huang-chiang-k'ou.

The Hungshui ho (page 561) flows into the Hsi chiang from north-westward close northward of Kuei-p'ing.

The spit of land eastward of Kuei-p'ing was reported, in 1934, to extend about half a mile farther east-north-eastward than charted.

Tong ku tan, or Brazen drum rapid, is situated just below the junction of the Hungshui ho with the Hsi chiang; there are many rocks in it and strong whirls and eddies, but it improves with a rise of the river. The navigation of this rapid is reported not to be so intricate as some of those previously mentioned, but, in August, 1906, H.M.S. *Moorhen* found the current in it to attain a rate of about 10 knots, which was the greatest rate experienced between Ts'ang-wu and Kuei-hsien.

Just above this rapid the change in colour of the river water from dark brown to clear blue is very marked.

Approaching Kuei-p'ing the rush of water from the Hungshui ho must be guarded against.

Anchorage.—The best anchorage is southward of the entrance to the Tai wong kiang, the bottom being of mud, free from rocks.

In 1935, H.M.S. *Cicala* anchored temporarily off Kuei-p'ing.

Kuei-p'ing to Kuei-hsien.—The height of the water in the river above Kuei-p'ing depends to a great extent upon the supply from the Hungshui ho as a great flood from the latter has the effect of checking the outflow.

Between Kuei-p'ing and Kuei-hsien, 59 miles farther up, the river flows through a large plain between high banks, which, at the ordinary level of the river, are about 40 feet (12^m2) high; the shores are in many places rocky. Mountains are visible over the banks in some parts, and after passing the village of Fuk shan or Fuchan tsuen, on

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Chart 1015.

the northern bank, about 10 miles above Kuei-p'ing, a remarkable rock, rising steeply to an elevation of about 2,000 feet (609m6), is visible southward at a distance of about 5 miles. The country above Kuei-p'ing is desolate, and consists of rolling downs covered with long grass and pines. The villages are few and small.

A pair of overhead telegraph cables crosses the river about three-quarters of a mile above Kuei-p'ing.

Mapu tan, a rapid about 2 miles above Kuei-p'ing, sometimes has a bad swirl in it between a point and a reef; this rapid improves with a rise of the river.

An overhead telegraph cable crosses the river about one mile below Kuei-hsien.

Kuei-hsien (Kweihsien) (*Lat. 22° 54′ N., Long. 109° 31′ E.*) is a district city situated at the foot of a range of mountains which extends northward in a great curve. There is a mission in the city.

Kuei-hsien is connected to the telegraph system.

At low river Kuei-hsien is the limit of navigation except for small boats.

Anchorage.—Good anchorage may be obtained off the southern bank, opposite the main steps at Kuei-hsien.

H.M.S. *Cicala* anchored abreast Yingping shan rocks, situated about 5½ miles below Kuei-hsien on her passage down the river in June, 1935.

Kuei-hsien to Heng-hsien.—From Kuei-hsien to Wa-t'ang-hsü (Ngatongsin), a small village on the southern bank at a distance of 16 miles, the river continues to pass between high banks, but above that village it flows through a valley having low hills on the northern side and hills about 1,500 feet (457m2) high, about one mile inland, on the southern side.

About one mile above Kuei-hsien a telegraph cable is carried over the river on high poles; the overhead clearance is a little over 60 feet (18m3) with the Ts'ang-wu tide-gauge showing 45½ feet (13m9), and the Yung-ning river-gauge showing 19½ feet (5m9).

Miaomen tan and Goa tan are rapids situated 4 and 10 miles, respectively, above Kuei-hsien, both of which, at low river, can only be passed by boats. At Goa tan there are three signal stations.

Taki tan, a rapid, is situated 2 miles above Wa-t'ang-hsü; a short distance farther up, the river enters Ngau pai gorge where it is only one cable wide, with a depth of 3 feet (0m9) at low river. Heungkong hiu is a small village, in which there is a prominent temple, on the western bank, about 22 miles above Kuei-hsien. Taipo tan, a rapid about half a mile long, is entered about 2½ miles above Heungkong hiu.

Leikung hsü, a village, is situated on the northern bank of the river about 30 miles above Kuei-hsien.

H.M.S. *Moorhen*, when anchoring off Leikung hsü, in 1913, in a depth of 5 fathoms (9m1), rock, was caught by an eddy and parted her cable; safe anchorage was found near the southern bank in a depth of 2 fathoms (3m7), but the bottom is rocky and eddies occur.

Tsingchao chau lies a short distance off the south-eastern bank about 2 miles above Leikung hsü.

Great rapid (*Lat. 22° 37′ N., Long. 109° 23′ E.*), about half a mile above Leikung hsü, is about 3 miles long; it consists of three parts, of which the middle part is the most dangerous. When H.M.S.

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Chart 1015.

Cicala passed through this part, in 1935, she had difficulty in keeping a steady course, and, steaming at a speed of 12 knots, only made good 2½ knots.

It is necessary to have a reading of 15 feet (4m6) on the river-gauge at Yung-ning before descending the Great rapid, but the ascent can be made with 6 feet (1m8) less water. For a vessel with a draught of 5 feet (1m5) it is advisable that the water-mark at Yung-ning should be at least 20 feet (6m1) for from 24 to 36 hours before attempting to pass through Great rapid, allowing about 1½ days for the level at Yung-ning to reach Great rapid. If necessary to wait for water in the river, vessels are recommended to stay at Kuei-hsien and obtain the height of water at Yung-ning by telegraph.

H.M.S. *Moorhen*, with a draught of 3 feet (0m9), passed the Great rapid in 1913, the height of the water at Yung-ning being 13 feet (4m0), and reported that the Great rapid really consists of three rapids; the first and third rapids presented no difficulties, but in the second the river was running rapidly, the ship steaming 13 knots and making, at times, very little headway. There were very strong eddies and much chow-chow water; the rocks, which were barely covered, appeared so numerous that it seemed almost impossible to get through, and two bad turns were negotiated with difficulty. After passing these rapids no further difficulty was experienced to Yung-ning.

H.M.S. *Tarantula*, in August, 1929, found that a speed of from 10 to 11 knots was sufficient to negotiate these rapids.

On the 12th of June, 1935, H.M.S. *Cicala*, drawing 5 ft. 3 ins. (1m6), passed the Great rapid, the water mark at Yung-ning having been 19 ft. 1 in. (5m8) 33 hours previously. There appeared to be then enough water to pass over all rocks in and near the fairway.

Just above the second rapid, on the northern bank, there is a fine temple in a grove of firs. Great rapid improves with a rise of the river, but is always dangerous, and a great obstacle to navigation. At 5 miles above the Great rapid a remarkable cave in the marble rock on the western bank is passed. Overhead telegraph cables span the river at Fonghuang shan (Phoenix mount), about 5 miles above Great rapid (*Lat. 22° 37′ N., Long. 109° 23′ E.*).

Heng-hsien (Hengchow), a small walled town, in which there is a post and telegraph office, stands on the northern bank, 54 miles above Kuei-hsien. Overhead telegraph cables cross the river about 1½ miles below Heng-hsien.

Anchorage.—Good anchorage may be obtained off the southern bank of the river opposite the main steps at Heng-hsien.

Heng-hsien to Yung-ning.—Above Heng-hsien the river widens until Sanchau tan is passed.

Sanchau tan, or Three Islands rapid, commences a short distance above Heng-hsien, and is 7½ miles long; the channel is close to the southern bank, and is fairly easy to navigate.

A few miles beyond Heng-hsien, the river flows between two ranges of high hills covered with trees, and with much vegetation. At the foot of the hills by the riverside, and on the numerous islands, there are lines and clusters of bamboos. Nan-hsiang-hsü (Namheung) is a village off which junks anchor, and is situated on the southern side of the river, 13 miles above Heng-hsien and 2 miles above Sanmen tan (Three Gates rapid).

Charts 2661a, 1263.

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Chart 1015.

Nan-hsiang-hsü is the terminus of the route, partly by land and partly by water, between the Hsi chiang and Pak-hoi, and is a likin station.

An overhead telegraph cable crosses the river just below Nan-hsiang-hsü. Fei-lung-hsü (Feilong tsuen), 13 miles above Nan-hsiang-hsü, is a small village situated on the north-western bank near a sharp bend in the river. For 10 miles above it the country on both sides of the river is hilly and densely wooded in many places, the vegetation reaching to the river. Farther up the hills gradually become lower, and in many places are terraced for cultivation, finally sinking into plains. Tatu miao, where there is a temple, stands on the eastern bank at a sharp bend in the river, about 4 miles above Fei-lung-hsü; there is anchorage off Tatu miao. Tauang miao, off which there is a rapid with a very strong current, stands about 5 miles below Yung-shun.

The town of Yung-shun (Wingshun) (*Lat. 22° 42′ N., Long. 108° 46′ E.*) is situated near a point on the western side of the river, 21 miles above Fei-lung-hsü. Here the river takes a right-angled turn and leads towards a range of mountains consisting of two parts, one trending north-north-eastward and the other westward, which latter the river follows closely until the hills fall into gently sloping downs; four overhead telegraph cables crossed the river, in 1929, about one mile above the right-angled turn.

Yung-shun is connected to the general telegraph system.

Good anchorage may be obtained close to the western bank below the town.

At 8 miles above Yung-shun the river becomes very narrow, with rocky banks, flowing between high hills on the northern side and low hills on the southern side; there are few villages, and the country is more uncultivated than below the town.

Good anchorage may be obtained off Ling-li-hsü (Linglo) on the northern bank, 13 miles above Yung-shun, and off Mantau tsuen on the same bank, 2 miles farther up-river.

P'u-miao (Pumiao hiu) stands on the southern bank of a sharp bend in the river, about 30 miles below Yung-ning. Pan tan, a rapid, situated about 22 miles below Yung-ning, has a dangerous rock in mid-channel. About 10 miles below Yung-ning good anchorage may be obtained off Chaongchong hiu, a village on the southern bank. A large pagoda stands on a hill about 7 miles below Yung-ning.

Approaching Yung-ning the river runs, with many windings, through an open plain, and the banks consist of almost level grass land leading to groves of bamboos and to villages amongst trees.

Telegraph cables, with an overhead clearance of over 60 feet (18^{m}3), with 16 feet (4^{m}9) on the Yung-ning river gauge, cross the river at a position about 3 miles below Yung-ning. An overhead telegraph cable crosses the river at T'ing-tzu-hsü (Tingtsen hiu) just below Yung-ning.

Yung-ning.—The city of Yung-ning (Nanning), which is the capital of the province of Kwangsi, is situated on the northern bank of the river. The southern wall follows the bank closely at the eastern end, but recedes some distance from it at the western end. The walled enclosure is small and the greater part of the inhabitants live in the suburbs outside. The Roman Catholic cathedral, a red building

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Chart 1015.

with two towers, and the city gates, are prominent objects. The foreign settlement is below the city, on the northern bank of the river.

Yung-ning is a treaty port. The city is connected with the Chinese telegraph system, and there is a post office.

The Emmanuel hospital, the property of the British Church Missionary Society, has accommodation for about 50 patients. There is also an American hospital, controlled by a missionary.

Anchorage.—There is good anchorage abreast the Customs station, on the south-western side of the river, where the full strength of the current is not experienced.

Trade.—The principal importance of Yung-ning lies in its position as a centre for the collection and distribution of goods and commerce of the four provinces—Yunnan, Kweichow, Kwangtung, and Kwangsi—it is, unfortunately, liable to inundation at high river. Small quantities of tobacco and star aniseed are produced in the prefecture, but Yung-ning is not a good producing centre. The principal articles passing through Yung-ning are sugar, aniseed, medicines, hides, and ground-nut cake.

Supplies.—Bread of the sweet type, chickens, beef, and ice can be obtained at Yung-ning (*Lat. 22° 43′ N., Long. 108° 03′ E.*).

Water is obtainable from wells, but should be filtered before drinking.

Communication.—There is road communication with Ts'ang-wu, the river being crossed by ferry at Kweiyuen, and also with Lung-chih-hsien.

River level.—A summary of the water level in the river at Yung-ning for the years 1919 to 1928 inclusive is given in the following table :—

Year.	Month.	Highest.		Lowest.	
		Feet.	Inches.	Feet.	Inches.
1919	May	12	7	0	7
	June	29	11	5	10
	July	24	2	6	10
	August	43	10	6	7
	September	32	0	5	5
	October	11	8	2	9
1920	May	14	7	2	5
	June	12	11	2	11
	July	28	4	7	2
	August	32	3	8	0
	September	45	1	14	2
	October	17	2	5	10
1921	May	26	9	0	11
	June	29	2	8	7
	July	47	7	8	3
	August	47	1	15	6
	September	43	0	13	6
	October	13	6	6	4
1922	May	6	8	0	1
	June	14	11	1	4
	July	28	11	6	4
	August	35	6	12	10
	September	28	2	5	8
	October	5	7	3	6
1923	May	12	9	2	4
	June	26	8	6	10
	July	33	8	7	2
	August	51	9	16	2
	September	21	3	7	11
	October	8	1	3	2

Charts 2661a, 1263.

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Chart 1015.

Year.	Month.	Highest.		Lowest.	
		Feet.	Inches.	Feet.	Inches.
1924	May	5	11	1	4
	June	31	9	5	3
	July	45	0	17	3
	August	37	7	14	4
	September	31	0	7	1
	October	14	2	4	6
1925	May	9	10	0	0
	June	21	5	4	10
	July	18	0	5	0
	August	12	6	3	11
	September	6	9	2	7
	October	8	1	1	10
1926	May	4	6	0	7
	June	24	5	4	2
	July	46	2	10	4
	August	38	2	13	6
	September	43	2	8	10
	October	38	6	7	5
1927	May	16	5	0	9
	June	17	7	3	2
	July	38	2	4	11
	August	37	5	8	7
	September	38	2	4	9
	October	21	7	5	11
1928	May	16	2	1	3
	June	33	5	7	4
	July	26	4	9	5
	August	37	3	8	4
	September	22	8	4	11
	October	9	4	3	1

See also diagram facing page 548.

River above Yung-ning.—Telegraph cable.—Above Yung-ning the river flows through a plain, the southern, or right, bank being well wooded, and the left bank somewhat barren.

About 4 miles above Yung-ning there is a bar which is crossed by keeping near the southern bank, and 14 miles farther above that city the channel narrows, passing northward of Tuo chau, a wooded islet, between rocks on the northern side of the channel and a sandbank extending from the islet; a strong current is experienced in this channel.

Between Tuo chau and Samkong, a town on the northern bank, 10 miles above, there are no dangers, and the adjoining country is high. Yili, a small village, stands on the south-western bank of the river, about 3 miles above Tuo chau.

An overhead telegraph wire crosses the river at Yili.

At Samkong (*Lat. 22° 38′ N., Long. 107° 47′ E.*), the Hsi chiang is joined by the Yu chiang from north-westward, and by the Li chiang (page 560) from south-westward.

Charts 1015, 2661a.

YU CHIANG.—General description.—When the reading on the river gauge at Yung-ning is 15 feet ($4^{m}6$) there is no difficulty in ascending to Pai-se (Poseh) but at dead low river, in the month of January, the channels in many places have depths of only 3 feet ($0^{m}9$).

H.M.S. *Moorhen*, in 1913, reported that there were no difficulties

Chart 1263.

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Charts 1015, 2661a.

between Yung-ning and Shia yuen, but after leaving Shia yuen, and between that place and Napo, the river is for the most part only from three-quarters of a cable to a cable wide; the high rocky banks are covered with foliage and the grandeur of the higher hills unsurpassed. On the whole, the passage was not hard to negotiate except for one or two dangerous turns, which proved even more difficult on the return journey with a following current. Lack of water in the river at Napo prevented the ship proceeding beyond that place.

In June, 1919, H.M.S. *Moorhen* proceeded up and down the river between Yung-ning and Pai-se, and reported encountering no rapids, and that parts of the river were found to be very narrow, only from 50 to 100 feet (15^{m}2 to 30^{m}5) wide in some parts, and that the passages and bends were in places very intricate.

The following distance table has been compiled from various authorities stationed on the river:—

Yung-ning*						
30	Samkong					
100	70	Lunganhsien*				
130	100	30	Kwohwa*			
175	145	75	45	Ping-ma*		
205	175	105	75	30	Napo	
261	231	161	131	86	56	Pai-se*

* Denotes postal telegraph stations.

Chart 1015.

From Samkong the Yu chiang trends in a north-westerly direction between low red hills, the channel passing through a shallow rapid about 3 miles above Samkong, where overhead telegraph cables cross the river.

Kum ling, a village on the right bank of the Yu chiang, is 7 miles above Samkong, and the river for a distance of 10 miles is wide, and presents no difficulty; the wooded banks are generally cultivated, and there are many villages.

Chart 2661a.

A prominent five-storied pagoda stands on a low hill on the left bank, 3 miles above which Lo lung tsa rapid is formed by a large wooded island in mid-channel. Lo lung hiu is a picturesque village with many brick-kilns on the left bank.

Wuyuantong ho, a large tributary from northward, joins the Yu chiang 20 miles above Samkong, and at the junction the Yu chiang takes a sharp turn westward for 10 miles.

Nga tung, where Sheong goi kai tan is passed, and Lung cheong, off which is a rock in mid-channel, are villages passed in ascending to Lungan hsien (Lung ngan tsen) (*Lat. 22° 59′ N., Long. 107° 21′ E.*), at which a pagoda, standing on a hill 3 miles south-eastward, is seen; the river here widens, and passing through a range of hills extending in a north-west and south-east direction, presents no difficulty.

Kum gi kok tan, a rocky rapid, is situated between the village of Tsin ha kuan and Ah gan; at 8 miles above the latter, and extending for a distance of 10 miles, the river passes through a succession of narrow gorges, with sharp turns, while rocky hills on either side attain an elevation of from 1,000 to 1,500 feet (304^{m}8 to 457^{m}2), and a range of mountains northward is nearly 2,500 feet (762^{m}0) high in places. Fo Fa cheung is a large village on the right bank, at 3 miles below which is a narrow, dangerous passage, where a rocky island divides the

Chart 1263.

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Chart 2661a.

channel, the passage being situated westward of the island. Above Kum gi kok tan the river forms long reaches, with easy curves, to within a few miles of Pai-se.

Yung long yuen, with a population of about 5,000, is the largest town between Samkong and Pai-se; it has a large trade in hides. Ni tung, Nga pan, and Tung kong are villages between Yung long yuen and Yi hong kiu; at the latter the river is joined by the tributary stream, Tin gau kiang, above which the channel is divided at Hong kai la by a large cultivated island, the northern passage being the deeper. Yi hong kiu is a village where there are several brick-kilns and a small range of hills, 1,000 feet (304m8) high, northward; on the southern side the hills are of a remarkable red colour. Above this point, to Pai-se, there are several narrow, intricate passages, the country being undulating, with high hills westward, and large aniseed plantations.

Pai-se.—Pai-se (Pe-sé), a walled city (*Lat. 23° 45′ N., Long. 105° 55′ E.*), is situated at the mouth of a large tributary known as the Szecheng kiang. It is the head of navigation, other than by small boats, and is a distributing centre. There is a large trade, conducted chiefly by junks. It is probable that a motor boat, 60 feet (18m3) long, could reach Pai-se with but little risk from April to November or December. *See* page 558.

There is a prominent pagoda one mile below the city on the left bank.

Anchorage.—Anchorage may be obtained on a large bank, off the mouth of the Szecheng kiang; the river at Pai-se generally rises about 24 hours after heavy rain.

Chart 1015.

LI CHIANG.—The Li chiang (page 527) leads to Lung-chih-hsien (Lungchow), near the Kwangsi-Tonkin frontier. When the reading on the river gauge at Yung-ning is 15 feet (4m6), navigating to Lung-chih-hsien is not difficult, and that place may be reached in two days from Yung-ning, a distance of 205 miles.

Yang-mei-chen (Yanguei hiu), about 2 miles above the junction with the Hsi chiang, is a large village, below which are many shingle islands covered at high river, and among which the current runs strongly. About 8 miles above Yang-mei-chen, the river, which runs between rocky wooded banks, narrows and winds between rocky mountains; there are but few villages. Longtau hiu, about 44 miles above Yung-ning, and Chueipien tsuen are small villages, on opposite sides of the river, apparently 5 miles apart, and above them perpendicular cliffs rise to a height of nearly 1,000 feet (304m8).

Sinningchow, a walled town about 62 miles above Yung-ning, standing back from the right, or eastern, bank of the river, is not seen when passing; the channel for 4 miles below that town to the village of Changcha tsuen is tortuous. T'o-lu (Tolu), a large village, is situated on the left, or north-eastern, bank about 20 miles above Sinningchow, or 64 miles below Ch'ung-shan (Taiping fu), and off it there is good anchorage. Overhead telegraph cables cross the river about one mile above this village, and there is a sharp turn of the river at Poyatang, a waterfall, about 5 miles above.

Wong cheong, about 7 miles below Ch'ung-shan, affords good

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Chart 1015.

anchorage close to the left, or western bank of the river. About 5 miles above this village a bar is crossed, and there is a dangerous, narrow passage at Kweilong ta, where a five-storied pagoda stands on a rocky point projecting into mid-channel.

Ch'ung-shan (Taiping fu), a walled city, is surrounded by the river except on its northern side. There is a telegraph and post office in the city, and a prominent white house stands just below it.

Anchorage may be obtained above the gravel bank off the main steps.

The Kuyun chiang (Hochuei ho) is a large tributary, with a pagoda marking its entrance, flowing from northward into the Li chiang about 24 miles above Ch'ung-shan, the channel between them being obstructed by many small islands, sandbanks, and rapids. Niau tan, or Ox rapid, is about midway. Tuomien hiu is a village on the left, or north-eastern bank, about 2 miles above the mouth of the Kuyun chiang; in this vicinity the banks are covered by groups of bamboos; at Hiangchuei hiu, 5 miles farther up, is a fine waterfall. Sanchau tan, or Three Islands rapid, about 3 miles above Hiangchuei hiu, is a narrow and intricate passage in which the current is strong; vessels when ascending should leave a wooded island on the port hand. From Sanchau tan to Lung-chih-hsien the river is narrow and shoal, with many small islands and sandbanks. The Ming chiang, a large tributary, joins the river from southward about 14 miles below Lung-chih-hsien.

Lung-chih-hsien.—Lung-chih-hsien (Lungchow) (*Lat. 22° 22′ N., Long. 106° 50′ E.*) is a walled city standing on the northern bank of the Li chiang, and is connected with the foreign settlement of the opposite shore by a bridge of boats.

Anchorage.—Rise of river.—There is no good anchorage, but the best is near the bridge. The river rises rapidly; in June, 1908, the level altered 8 feet (2^m4) in 5 hours; a rise generally occurs within 24 hours after heavy rain. About the 20th of July, 1911, the water was 37 feet (11^m3) above zero. (*See* page 557.)

Charts 2661a, 1263.

HUNGSHUI HO AND LIU CHIANG.—The Hungshui ho and the Liu chiang were ascended by H.M.S. *Robin* between 23rd and 28th June, 1935, to within 24 miles of Ma-p'ing (Liuchow). The river level at Ts'ang-wu was 61·2 feet (18^m6), rising, and at Yung-ning, 28 feet (8^m5), rising, on 23rd June.

H.M.S. *Moorhen* ascended these rivers in June, 1910, April, 1914, and May, 1919.

To ascend the Liu chiang the following procedure is recommended: Before leaving Ts'ang-wu the water level should be over 20 feet (6^m1).

If the water level at Kuei-p'ing (page 553) is above 20 feet (6^m1), a vessel can proceed to Shih-lung-hsü (Shek lung) (page 563), provided that the current in the Mo shan gorge (page 562) is not running too fast; information with regard to the state of the rivers can be obtained at Kuei-p'ing from native vessels coming down.

From Shih-lung-hsü a vessel can proceed to Wang lai tan (page 564), when the water level at Ma-p'ing is more than 10 feet (3^m0), or is more than 5 feet (1^m5) and rising. This information can be obtained by telephone from Shih-lung-hsü.

Chart 1263.

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Charts 2661a, 1263.

When the rocks situated 3 miles below Wang lai tan are covered a vessel can proceed to Kai laak (page 564).

When the river level at Ma-p'ing is 18 feet (5^m5), or 12 feet (3^m7) and rising, an ascent can be made to that city. It is not usual for the level of the river above Wang lai tan to decrease more than 5 feet (1^m5) in 12 hours after it has attained a height of 15 feet (4^m6) or less.

Effects of river heights.—The height of water at Ts'ang-wu affects the river as far as Kuei-p'ing.

The height of the Hsi chiang at Kuei-p'ing affects the height of the Hungshui ho as far as Wu-hsüan (page 563). The height of the Liu chiang at Shih-lung-hsü affects the height of that river as far as Wang lai tan. The height of the river at Ma-p'ing gives the height of the river from that city to Wang lai tan. The height of the river at Yung-ning is only relevant in that it may assist in forecasting the tendency at Kuei-p'ing and Ts'ang-wu.

Chart 2661a.

Hungshui ho.—This river joins the Hsi chiang from north-westward just below Kuei-p'ing, in approximately lat. 23° 25′ N., long. 110° 05′ E. The river winds in a general north-westerly direction, with several sharp bends, as far as San-chiang k'ou, about 66 miles above Kuei-p'ing, where it is joined from northward by the Liu chiang. At San-chiang k'ou the Hungshui ho takes a south-westerly and westerly direction and is not navigable.

Low overhead telegraph cables cross the river just above Kuei-p'ing.

Lo tan, a tortuous rapid, lies about 4 miles above Kuei-p'ing; this rapid is well covered and presents no difficulty with the water level at 20 feet (6^m1) at Kuei-p'ing, but with less water navigation might not be possible.

Above Lo tan is Mo shan gorge, from 3 to 4 miles long and from 50 to 100 yards (45^m7 to 91^m4) wide, in which the banks rise precipitously on both sides, and are covered with dense jungle, continuing thus for about 14 miles. Tai tong gorge is a continuation of Mo shan gorge.

Pik tan shan, about 1,000 feet (304^m8) high, lies near the eastern or left bank about 14 miles above Kuei-p'ing. Pik tan, a rapid, is situated abreast this hill. Hung shek, a large rock only covered by a few feet at high river, with a rapid of the same name below it, lies in mid-river about 4 miles above Pik tan shan. About 5 miles above Hung shek the river becomes wider and the banks less steep.

With the river level at approximately 20 feet (6^m1), falling, a current with a maximum rate of 9½ knots has been experienced in the above-mentioned gorges; the swirls and eddies were considerable. If the water level in the Hsi chiang was high and the Hungshui ho flooding very fast, the eddies and currents in Mo shan gorge might be too strong for navigation. If the water level at Ts'ang-wu was under 20 feet (6^m1), and the water level over 25 feet (7^m6) in the Hungshui ho below Wu-hsüan (*Lat. 23° 40′ N., Long. 109° 24′ E.*), the rapids in the gorges would be too dangerous for navigation.

Yau lang, a village with a joss house near it, stands on the northern bank, about 8 miles above Hung shek. About one mile below Yau lang there is a spit extending from the northern bank; off this spit there is a rapid.

Between Yau lang and Luk ma tau, a village situated on the eastern

Chart 1263.

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Chart 2661a.

bank about 7 miles farther up, there is a series of rapids and the river is encumbered with rocks and islets; it is bounded on its northern side by wooded hills, gradually rising to an elevation of about 3,000 feet (914^{m}4), forming a tongue round which the river curves.

Su ku chow, a wooded islet, lies in mid-river about half a mile above Luk ma tau; the eastern bank abreast Su ku chow is high, and just above the islet the river turns sharply in a south-westerly direction for a short distance.

The village of Cheung shan chau stands on the eastern bank about 5 miles above Luk ma tau.

The city of Wu-hsüan (Wusüan), the capital of the Mosün district, stands on the eastern bank about 2 miles above Cheung shan chau, and 40 miles above Kuei-p'ing. Low overhead telegraph cables cross the river just below Wu-hsüan (*Lat. 23° 40′ N., Long. 109° 24′ E.*).

Above Wu-hsüan the river flows between banks, about 40 feet (12^{m}2) high, with flat country on both sides; abreast Wu-hsüan, and for about 4½ miles northward and southward of it, there are some remarkable limestone peaks rising out of the flat country on the western side of the river.

About 10 miles above Wu-hsüan there is a sharp bend, in which H.M.S. *Moorhen* anchored, in a depth of 4 fathoms (7^{m}3), sand.

Lung kau tu, a rapid, is situated about 6 miles above the sharp bend, and there are a series of rapids for a further 5 miles up the river.

An islet lies near the north-western bank, about one mile above Lung kau tu.

The Liu chiang joins the Hungshui ho at San-chiang k'ou, 66 miles above Kuei-p'ing. The junction is full of rapids, three-quarters of a cable wide, but deep. From San-chiang k'ou the Hungshui ho takes a south-westerly direction and is unnavigable.

Anchorage.—There is anchorage just within the mouth of the Hungshui ho, off the northern end of the suburbs of Kuei-p'ing, close to the bank and between the telegraph cables crossing the river.

Liu chiang.—Shih-lung-hsü (Shek lung), a market town, connected by telephone with Ma-p'ing, stands on the north-western bank of the Liu chiang, about 3 miles above San-chiang k'ou junction. Vessels are recommended not to ascend to Wang lai tan (page 564) until the water level at Ma-p'ing is more than 10 feet (3^{m}0), or is 5 feet (1^{m}5) or more, and rising.

Overhead telegraph cables cross the river just above Shih-lung-hsü.

A rock, which is covered when the water level is 10 feet (3^{m}0), lies close to the north-western bank about half a mile above Shih-lung-hsü.

The village of Im cheung, off which there is a rapid, stands on the northern bank about 6 miles above Shih-lung-hsü. About 2 miles above Im cheung there is a sharp bend in the river and, about 2½ miles farther up, the walled city of Hsiang-hsien (Siang) (*Lat. 23° 58′ N., Long. 109° 23′ E.*), about 80 miles above Kuei-p'ing, is situated on the eastern bank of the river. Overhead telegraph cables cross the river just above Shih-lung-hsü.

Chart 1263.

There is a low islet in mid-river about half a mile above Hsiang-hsien, and about three-quarters of a mile farther up, Ngua kok chau, 30 feet (9^{m}1) high, lies in mid-river, with Ku toi tan, a rapid, on both sides of it.

Chart 1263.

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Chart 1263.

About 3 miles above Ngua kok chau there is a low islet in mid-river, and a similar islet about 4 miles farther up. A short distance below the last-mentioned islet there is a sandy beach, which covers when the river level is about 25 feet (7m6). Good anchorage can be obtained close below this beach.

Wan kong, a market town, stands on an island in mid-river, 50 feet (15m2) high, and surrounded by rocks, is situated about 11 miles above Ngua kok chau, and 93 miles above Kuei-p'ing.

Tsung ping river joins the Liu chiang from north-eastward abreast Wan kong. Tau kwong, a village, stands on the northern bank of the river about 5 miles farther up, where another river joins the Liu chiang from northward.

Kau pin shan, 1,500 feet (457m2) high, with a double peak, stands on the southern side of the river, about 2 miles above Tau kwong. The last 600 feet (182m9) of the summit of this mountain is sheer rock, and it can be seen from a position about 20 miles above Kuei-p'ing.

Pak tsai river joins the Liu chiang from northward about 3 miles above Kau pin shan. The village of Kong hau stands on the western side of the mouth of the Pak tsai river, and the village of Pak sha, in which there is a tower, stands on the southern bank of the Liu chiang opposite. There is an island in the river about one mile below Pak sha. About 3 miles above Pak sha, there is a rocky bar, which cannot be crossed when the water level at Ma-p'ing is less than one foot (0m3).

Between Pak sha and Wang lai tan, a rapid, about 9 miles farther up the river, there are three sharp bends. The current runs at a rate of about 7 knots through Wang lai tan, and in the rapid there are several dangerous rocks, leaving a passage only 30 feet (9m1) wide, in which there is a right-angled turn. About 3 miles below Wang lai tan there are some rocks, which cover when the water level at Ma-p'ing is 12 feet (3m7). Vessels can anchor about 1¼ miles below these rocks.

Lo pin shan, 1,000 feet (304m8) high and prominent, lies on the northern bank of the river about one mile above Wang lai tan.

Yeung hot, a village, stands on the northern bank about 7 miles above Wang lai tan, and, about one mile farther up, on the other bank, is Kai laak, which is connected to the telephone system and where there is a factory. There is a waterfall and a power station, on the right bank just below Kai laak. Ma-p'ing is 5 miles by road, and 24 miles by river from Kai laak.

Lo baik chau, a wooded islet, lies about 10 miles above Kai laak. The river here is shallow and, above this island, there is a rocky bar, over which there are two passages, one 30 feet (9m1) wide, with a depth of 7 feet (2m1) in the fairway, and the other wider and closer to the right bank, with a depth of 4 feet (1m2) in the fairway. On the left bank is the market town of Lok kan hiu, with a temple on a hill near.

Tu po, a village, stands on the right bank about 8 miles above Lo baik chau. An island, at the northern end of which there is a bar, with a depth of 4 feet (1m2) over it, lies abreast Tu po. The telegraph line from Kwei lam follows the left bank from opposite Tu po to Ma-p'ing.

Ma-p'ing (*Lat. 24° 10′ N., Long. 109° 32′ E.*) is situated on the northern bank about 155 miles by river above Kuei-p'ing.

Chart 1263.

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Chart 1263.

Above Ma-p'ing the river is reported to be navigable by small junks as far as Changan in about lat. 25° 11′ N., long. 109° 18′ E.

Chart 2661a.

Anchorages.—There is good anchorage abreast Shih-lung-hsü.

Chart 1263.

There is good anchorage abreast the factory at Kai laak. A vessel can remain at Kai laak while the water level at Ma-p'ing is more than 15 feet (4m6), or above 12 feet (3m7) and rising.

The anchorage at Ma-p'ing is just below the ferries, at the apex of a semicircular bend in the river round the city.

Ma-p'ing.—Ma-p'ing (Liuchow) is a large walled city, surrounded by hills from 500 to 800 feet (152m4 to 243m8) high.

The city is connected to the telegraph system, and there is a postal service by runners to Ts'ang-wu, 4 or 5 days' journey.

Bread and other provisions are obtainable.

There is a mission station at Ma-p'ing.

Chart 2734, plan of Samshui reach.

SAN-SHUI REACH. — Dangers. — Lights. — Beacons. — San-shui (Samshui) reach connects the Hsi chiang with the Pei chiang, and, at its eastern end, is connected with the Chu chiang through Fat shan branch (page 637) and Hsi-nan (Sainam) creek (page 566).

The depths in the reach, which is only available for small craft, are reported to change considerably every year after the summer freshets.

San-shui reach is entered from the Hsi chiang through San-shui junction (page 565), between Mandarin point, on which is the village of Siin kau, and Entrance point, about one cable southward. Sun hui, a village, stands on the south-eastern side of the junction, about 2 cables eastward of Entrance point.

A light is exhibited, at an elevation of 40 feet (12m2), from a white mast, 36 feet (11m0) in height, on Mandarin point.

Mandarin shoal, off the entrance to San-shui junction, is mentioned on page 540.

A bank, with depths of less than 6 feet (1m8) over it, extends half way across San-shui junction from its north-western side.

Kong kun, or Tweed point, lies on the south-eastern side of the junction, at its northern end, about 7 cables north-eastward of Mandarin point, and Frasers hill, 200 feet (61m0) high, lies on the same side about half a mile farther north-eastward. Kong kun stands close southward of Kong kun point.

A light is exhibited from a white mast, 12 feet (3m7) in height, surmounted by a daymark, situated close off Kong kun point (*Lat. 23° 09′ N., Long. 112° 49′ E.*).

Fish point, the southern extremity of Lo ah chau, or Rattler island, lies about 2½ cables north-north-eastward of Kong kun point, and Chow wei (Low point) is the eastern extremity of the same island.

A light is exhibited from a light-vessel, with a white mast, 12 feet (3m7) in height, moored off Fish point. By day this light-vessel displays a red flag.

A beacon, surmounted by a white cylinder, stands on Chow wei.

A sandbank, which dries, lies close off the south-western side of Lo ah chau.

Charts 3218, 2562, 2661a, 1263.

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Chart 2734, plan of Samshui reach.

Between the south-eastern side of Lo ah chau and the south-eastern shore of San-shui reach there is a bank, with depths of from 2 to 6 feet (0m6 to 1m8) over it. For tidal signal, *see* below.

A rock, with a depth of less than 6 feet (1m8) over it, lies close offshore northward of Frasers hill (*Lat. 23° 09′ N., Long. 112° 50′ E.*).

A bank, which dries and which is one cable wide in places, extends from the southern side of San-shui reach from between a point situated about 1½ cables eastward of Frasers hill and the eastern limit of the harbour.

Pei chiang, or North river (page 568), enters the north-western end of San-shui reach on either side of Lo ah chau.

The village of Hokau, close eastward of which there is a Custom house, stands on the northern side of San-shui reach about half a mile east-north-eastward of Chow wei. There are some steps close to a joss house on the northern bank about half a mile eastward of the Custom house, and an oil depôt, with a flagstaff, a short distance farther eastward.

A rock, 11 feet (3m4) high, on which is a beacon, lies in midstream about one mile eastward of Chow wei. A line, indicated on the chart, through this rock forms the eastern limit of San-shui harbour.

The western end of Sun sha, an island, is situated about half a mile eastward of the last-mentioned rock; a wooded islet lies about 2 cables north-westward of the eastern end of Sun sha, and a short distance off the northern side of that island.

A spit, with a depth of one foot (0m3) over it, extends 1½ cables from the southern side of the reach, close eastward of the eastern limit of the harbour.

A drying bank extends about 2½ cables westward from Sun sha. A narrow spit, with a depth of one foot (0m3) over it, extends about 2 cables from a point on the northern side of Sun sha about half a mile westward of the north-western end of Lo sha; close westward of this spit, a drying bank extends from the northern bank of the river half way across the channel, and close eastward of the spit there is a small drying patch in mid-channel.

In October, 1935, with one foot (0m3) on the tide-gauge at San-shui, a sandbank, almost awash, extended three-quarters of the way across the channel southward of Sun sha, from the hill charted westward of the steps; another bank extended from the northern side of this channel opposite the steps.

The channel, in 1935, was southward of Sun sha. There are some steps on the southern bank, abreast the middle of Sun sha.

Lo sha, an island, almost covered by buildings, lies close off the eastern end of Sun sha, connected with it by a drying bank. There is a chimney near the north-western end of Lo sha, and a tower near its south-eastern end.

The town of Hsi-nan (Sainam) stands on the northern side of San-shui reach abreast Lo sha. Hsi-nan creek enters San-shui reach from north-eastward, close eastward of Hsi-nan, and Fat shan branch (page 637) enters the reach south-eastward of Lo sha.

Telegraph cables.—Overhead telegraph cables, indicated on the chart, cross San-shui reach from Hsi-nan to Lo sha.

Tidal signal.—Tide-gauge.—A black ball is displayed at the Custom house at Hokau when the depth on the bar is less than 8 feet (2m4).

Charts 3218, 2562, 2661a, 1263.

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Chart 2734, plan of Samshui reach.

There is a tide or river-gauge near Kong kun point, marked from 3 feet (0^{m}9) below zero to 13 feet (4^{m}0) above zero.

River level.—Floods may be expected once, if not twice, a year, and then only if there are freshets in the Pei chiang and Hsi chiang at the same time; they usually occur in June and July. The highest levels above a zero of 8 feet (2^{m}4) on the bar were 26 feet (7^{m}9) in 1897, 14 feet (4^{m}3) in 1898, and 22 feet (6^{m}7) in 1899. The river, in 1900, was remarkable for the early date (end of July) and the sustained lowness of its fall. The bar showed its maximum, 18 feet 10 inches (5^{m}7) in July, and its minimum, 3 feet 7 inches (1^{m}1) in December. The freshets are usually accompanied by violent squalls, and the river becomes a sea of wild turbulent waters sweeping past like a mill-race.

See diagram of average daily water-levels at San-shui, Ts'ang-wu and Yung-ning, facing page 548, and also the remarks on the Pei chiang (page 568).

Anchorages.—The anchorage for gunboats off the Commissioner's house at Hokau has good holding ground, but is exposed in summer to sudden heavy squalls from south-eastward; it is obstructed in winter by shifting sandbanks, so that it is closed at that season to vessels drawing over 5 feet (1^{m}5). The anchorage outside the bar off Kong kun, where steam vessels anchor during the winter season, can with difficulty accommodate more than three vessels at one time. Both anchorages are liable in summer to sudden freshets from the Pei chiang.

Vessels unable to cross the bar between Lo ah chau and Frasers hill to the anchorage off the Custom house, eastward of Hokau, anchor off Kong kun.

Directions.—The plan is unreliable, and vessels should not attempt to enter from the Hsi chiang without recent local knowledge. Entering San-shui reach, great attention must be paid to the steering on account of the strong swirls and eddies.

Numbers of native craft and immense rafts are often met with in the entrance; as the rafts are kedged up, their progress is very slow, and they impede navigation.

The large rafts, measuring perhaps 400 feet by 150 feet (121^{m}9 by 45^{m}7), which sometimes come down the Pei chiang three or four at a time, and occupy almost the entire width of the river, as well as large stacks of pine-tree branches, measuring 30 feet by 15 feet (9^{m}1 by 4^{m}6), which are floated down two abreast on boats lashed together, for burning in lime-kilns and factories, are dangerous to navigation. Sometimes twenty or more of these rafts and stacks are in close proximity to one another.

San-shui.—The town of San-shui (Samshui) (*Lat. 23° 11′ N., Long. 112° 50′ E.*), on the eastern side of the mouth of the Pei chiang, is situated about half a mile northward of Hokau; it is a place of considerable trade, but the greater part of the business is said to be carried on in Hsi-nan (page 566). Hokau, the port of San-shui, being outside the embankment, is more or less flooded for six months of the year.

Communication.—San-shui is connected by rail with Canton. There is frequent steamer communication with Hong Kong.

San-shui and Hsi-nan are connected to the general telegraph system.

Supplies.—Small quantities of provisions can be obtained.

Charts 3218, 2562, 2661a, 1263.

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Chart 2734, plan of Samshui reach.

There is a fuel oil depôt on the northern bank about three-quarters of a mile eastward of Hokau, where there is a small jetty, with a pipe line.

The water at San-shui and above is not fit for drinking, but is suitable for water-tube boilers; in summer it is muddy.

Storm signals.—When bad weather is probable, one black ball, by day, is displayed, or one *red* light, by night, is exhibited at the Custom house at San-shui.

When a typhoon or a strong gale is probable, two black balls, disposed vertically, by day, are displayed, or two *red* lights, disposed horizontally, by night, are exhibited.

Chart 3218.

PEI CHIANG.—Pei chiang or North river, locally known as Pakkong, rises in the north-eastern corner of Kwangtung province. At Ch'u-chiang (Shiuchow) (*Lat. 24° 48′ N., Long. 113° 30′ E.*) it turns southward, and after a course of about 140 miles, through the middle of Kwangtung province, passes westward of San-shui into San-shui reach (page 565).

Except at certain times in the spring, when a freshet forces the Pei chiang to run into the Hsi chiang, these two rivers never really mingle. The rises in them seldom occur simultaneously; thus, in July, 1904, the Hsi chiang was in flood, with the tide-gauge at Ts'ang-wu showing 51 feet (15^{m}5), whereas the Pei chiang was only 5 feet (1^{m}5) above its winter level.

Although the Pei chiang can hardly be classed among the large rivers of China, it may claim to be considered an important waterway, having served for many centuries as part of the great trade route between Canton and the cities in the Yangtze valley. The ruins of temples, rest houses, and jetties, met with all along its course, bear witness to the very considerable trade which at one time existed.

The country of the Pei chiang basin northward as far as Ching-yuan (Tsing yün) is flat, fertile, and well populated.

Above Ching-yuan the country is mountainous, but there is excellent grazing country, especially near Ch'u-chiang. The river valley is sparsely populated.

Navigability.—Below Ying-te (Yingtak) (*Lat. 24° 10′ N., Long. 113° 20′ E.*), 90 miles from the entrance, the Pei chiang, although shallow in places, presents no exceptional difficulties to small vessels, as navigation is not impeded by rocks and rapids. Steam launches, with a draught of not more than 4 feet (1^{m}2), and under normal conditions of the river, can reach Ching-yuan, 47 miles up, during about seven months of the year, and Ying-te during about five months (or from May to September).

From Ying-te to Ch'u-chiang, about 147 miles up, the river narrows considerably, and becomes extremely intricate, with many shallows and rapids. There are a few rocks, and these being close to the banks are not dangerous, but the sand and gravel banks, which frequently shift, cause great difficulty. Navigation in this part of the river, even for native craft, depends entirely on the rainfall; a heavy rainfall causes the river to rise from 12 to 18 inches (0^{m}3 to 0^{m}5) in 24 hours. April, May, and June are the only months when a vessel of 2½ feet (0^{m}8) draught could depend on reaching Ch'u-chiang.

Charts 2562, 2661a, 1263.

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Chart 3218.

H.M.S. *Robin*, with a draught of 2 feet 6 inches (0m8), ascended to Ch'u-chiang in June, 1901; and again in July, 1904, when the river was 5 feet (1m5) above winter level at San-shui. Considerable difficulty was experienced above Ying-te, the rapids in places being very strong, attaining a rate of 7 knots. On the return on the 17th of July, about 4 miles below Ch'u-chiang, the river rose 9 feet (2m7) in 11 hours.

In April, 1905, H.M.S. *Robin* again ascended to Ch'u-chiang. The river was 8 feet (2m4) above winter level on leaving San-shui, and the current setting round Lo ah chau was practically a race. On reaching Wu shih hsü, 124 miles up, the vessel was delayed 8 days, owing to a fall in the river, and another 7 days at Tung kwu chau, 138 miles up, for the same reason. Ch'u-chiang was reached on the 15th of May, the passage having occupied 23 days.

Caution.—Inconvenience has been experienced throughout this river from weeds fouling the screws and choking the condenser inlet. As sandbanks shift, silt up, or disappear, and the channels alter with every heavy flood, local knowledge is indispensable to navigate the Pei chiang.

Stone-carrying junks, laden to the water's edge, generally drift down broadside to the current, and are almost unmanageable.

For the rule of the road, *see* page 527.

Pilots.—A pilot can usually be obtained at San-shui who can take a vessel as far as Ching-yuan. Vessels proceeding above this must obtain an Asiatic Petroleum Company's pilot from Canton, for which 24 hours' notice is necessary.

Current.—The current runs down the Pei chiang at a rate of from 2½ to 3 knots, which is much accelerated during the rainy season.

Chart 2734, plan of Samshui reach.

The current is divided by Lo ah chau, at the mouth of the river, and sets directly on Kong kun point (page 565). For the greater part of the year, the current runs from the Pei chiang into the Hsi chiang, but during the height of the rainy season it may be reversed. *See* River level (page 567).

Chart 3218.

It is stated that between Wang fu kang and Ch'u-chiang there are 14 places where the river flows at a rate of about 7 knots, over beds of large stones with depths of from 3 to 4 feet (0m9 to 1m2) over them, the channel at these places being only about 40 feet (12m2) wide.

Charts 2734, 3218.

San-shui to Ying-te.—The approximate positions of the islands and shoals in the Pei chiang can best be seen on the chart. The channel between Lo ah chau and the north-eastern side of the mouth of the river was reported, in 1905, to dry at low river. The Sui chiang or Bambus river (page 572) joins the Pei chiang from north-westward about 5 miles above San-shui. Pai-ni chiang (Lupa creek) (page 638) joins the Pei chiang from eastward about 15 miles above San-shui; the town of Lupao stands on the northern side of the mouth of Pai-ni chiang (*Lat. 23° 22′ N., Long. 112° 55′ E.*).

There is frequent communication by steam launch between Lupao and Canton.

Chart 3218.

Shih-chiao-hsü (Shakok), a large town, with a considerable trade in

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Chart 3218.

shipping, stands on the eastern bank of the Pei chiang, about 16 miles above Lupao. There is a 5-storied pagoda on the western bank abreast Shih-chiao-hsü.

Ching-yuan (Tsing yün) (*Lat. 23° 45′ N., Long. 113° 08′ E.*), a town, is situated on the northern, or right, bank, about 12 miles above Shih-chiao-hsü. Ching-yuan is the headquarters of two missionary societies, and its principal industries are the manufacture of flour, ground-nut oil, and matches.

The hills in the vicinity of Ching-yuan are wooded, and there are tigers in the jungle. Here the plain ends and the river flows through a mountainous country, practically without interruption, to the borders of the provinces of Hunan and Kiangsi.

There is frequent communication by steam launch between Ching-yuan, Canton, and Ying-te.

Between Ching-yuan and Ying-te, 90 miles above San-shui, the river banks are covered with bamboos.

Fei-lai hsia (Fei loi tze) gorge, which is 3 miles in length, is entered about 9 miles above Ching-yuan; here the river narrows and flows between hills rising abruptly to an elevation of about 500 feet (152^{m}4). Pai-miao (Pakmiu), a station where salt for the Lien-hsien district is transferred from the large Canton junks into smaller craft, is situated on the northern bank at the entrance to the gorge. About three-quarters of a mile above Pai-miao stands the famous monastery of Fei lai hsia. There are limestone quarries on either side of the gorge, and these occur at short intervals on both banks of the river for the next 50 miles.

The river above the gorge widens; the hills recede from the bank, becoming higher and more wooded than before.

P'ao-chiang-k'ou-hsü (Pak kong kiau) stands on the south-eastern bank of the river just above Fei lai hsia gorge; there is a telegraph station at Kaun-ch'ien-hsü (Kwan chin), 4 miles inland. The railway from Canton to Hankow meets the Pei chiang near this town.

Heng-shih-hsü (Wongshek), a small market town, is situated on the western bank of the river about 7½ miles above P'ao-chiang-k'ou-hsü; the town is connected with the Canton-Hankow railway. Between Heng-shih-hsü and Ta miu hap, about 3 miles farther up the river, both banks are lined with bamboo groves. At Ta miu hap the river winds between high hills and precipitous cliffs. Heung lu hap, or Censer gorge, is entered a short distance farther up the river. Wang-ch'eng-k'ou (Wong shang kau), a village, stands on the western bank of the river, about 76 miles above San-shui; there is a small cascade on the eastern bank abreast Wang-ch'eng-k'ou.

Chart 3218, plan of Linchow kong.

Hsiao-pei (Hwangshui) chiang (page 572) enters the Pei chiang from north-westward about 1½ miles above Wang-ch'eng-k'ou. Kong hau is situated at the junction.

Chart 3218.

Mong si hap, a gorge, about 3 miles long and from 50 to 100 yards (45^{m}7 to 91^{m}4) wide, is entered close above Kong hau. On a cliff, and on the western bank of the Pei chiang, in this gorge there is a striking profile of a face, visible from certain directions. At the northern end of this gorge there is a sunken rock which should be passed on its eastern side. Tai shek leng, or Lau tai wan, is on the

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Chart 3218.

western bank of the Pei chiang, about 2¾ miles above the northern end of Mong si hap. There are some limestone quarries here.

Ying-te (*Lat. 24° 10′ N., Long. 113° 20′ E.*), a small walled town, is situated on the north-western bank, about 3½ miles above Tai shek leng. Ying-te stands in an amphitheatre of rugged hills, just above a range of limestone cliffs, which, jutting out into the river, forms one of the "gates" of the Pei chiang.

There are two mission stations at Ying-te.

The Shen-ch'ien chiang (Yung kong) joins the Pei chiang from south-eastward opposite Ying-te; it is only navigable for small boats which bring down charcoal from Yungyun, about 30 miles up the river.

Communication.—Ying-te is connected to the Canton-Hankow railway and to the general telegraph system.

There is frequent communication by launch with Ching-yuan and Canton, from about May to September.

Telegraph cables.—Overhead telegraph cables indicated on the chart, cross the river a short distance below Ying-te, and also a short distance up the Shen-ch'ien chiang.

Ying-te to Ch'u-chiang.—The channels between Ying-te and Mau yu shek, on the eastern bank, 3 miles above, are narrow and difficult. The Pei chiang, for some miles above Ying-te, flows between high banks through fertile, cultivated country.

Ho-t'ou-hsü (Mongfukong), a village, stands on the north-eastern bank of the river, about 6 miles above Ying-te. About 5 miles farther up on the western bank is the celebrated Kuan yin chien (shan), a cliff of rock, covered with dense foliage, on the northern side of the entrance to Sulphur river. This cliff rises almost vertically some 600 feet (182^{m}9), and in it are the cave temples dedicated to Kun yem, the Goddess of Mercy; at the foot of the hill a stone stairway leads into the caverns which pierce the cliff in all directions.

Sha-k'ou-hsü (Sha how) stands on the eastern bank about 9 miles above Kuan yin chien; here the Canton salt junks tranship their cargoes into small flat-bottomed junks during the low-river season, and the small junks proceed up the river beyond Ch'u-chiang.

There are two mission stations at Sha-k'ou-hsü.

Wu-shih-hsü (Wu shek) is a small town on the left bank of the river about 12 miles above Sha-k'ou-hsü and 124 miles above the entrance. Pai-t'u-hsü (Pakto) is a large village on the right bank, 9 miles above Wu-shih-hsü, and 131 miles above the entrance.

Lung kwei river joins the Pei chiang from westward just above Pai-t'u-hsü; this river flows through a mountainous country.

Ch'u-chiang.—Ch'u-chiang (Shiuchow) (*Lat. 24° 54′ N., Long. 113° 32′ E.*), 14 miles above Pai-t'u-hsü, and about 140 miles above the entrance, is the principal city in northern Kwangtung, and is well situated on a peninsula, formed by the junction of the Wu shui (page 573) with the Pei chiang. The principal business quarter is the Cantonese suburb outside the wall facing the Pei chiang. The Yamens are in the native or Hakka quarter, near the West gate, off which there is anchorage. Ch'u-chiang is a distributing centre for the country around, and an important Customs barrier; bridges of boats stretch across the rivers just above the junction.

Communication.—Ch'u-chiang is on the Canton-Hankow railway, and is also connected to the general telegraph system.

Charts 2562, 2661a, 1263.

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Chart 3218.

There are several missions at Ch'u-chiang.

Trade.—The principal exports are various oils (chiefly ground-nut oil), coal, sugar, and cereals. The minerals existing, besides coal, are iron, silver, copper, lead, plumbago, and asbestos. The imports are kerosene, flour, piece goods, Bombay yarn, lamps, &c.

Climate.—The climate of Ch'u-chiang is hot in summer, and, owing to the sudden changes in temperature, caused by alternating northerly and southerly winds, is unhealthy for Europeans. The winter is cold, frost and snow being of frequent occurrence.

Plague is unknown; cholera and smallpox are common.

Fauna.—The surrounding country, besides being extremely picturesque, abounds in wild animals of all kinds, among which deer, wild boar, porcupines, monkeys, leopards, and tigers may be mentioned. The Siberian wolf is also found near Ch'u-chiang. Snipe and partridge are fairly plentiful.

River above Ch'u-chiang.—The Pei chiang, from Ch'u-chiang, leads to Namyung, over 60 miles farther up the river; it is impeded by rapids, and is navigable only by shallow-draught junks.

Chart 2734.

Sui chiang.—The Sui chiang (Sui kong, or Bambus river) rises in the eastern corner of Kwangsi, and is a principal tributary of the Pei chiang; it flows from westward and joins the Pei chiang as described on page 569. H.M.S. *Sandpiper*, in July, 1909, when both this river and the Pei chiang were fairly low, ascended to Ssu-hui (Szewui) (*Lat. 23° 23′ N., Long. 112° 40′ E.*), a distance of 14 miles.

The channel was, in 1909, narrow and shoal, with many sandbanks, the river having a breadth of from 200 to 300 yards (182^{m}9 to 274^{m}3); a shifting bar obstructed the entrance, and several bars, with depths of 3 feet (0^{m}9) over them, were crossed. Weng kong, a village on the north-eastern bank, is situated about 7 miles above the entrance, the intervening country being flat; above Weng kong the banks are fringed with bamboos, and, on the southern side, the country is hilly and picturesque. A rock lies in mid-channel just below Weng kong.

Ching ki creek (page 540) joins the Sui chiang from southward about 3 miles above Weng kong.

Ssu-hui is a walled town on the left bank of the Sui chiang; the channel off the town was found to be narrow, with depths of from 4 to 5 feet (1^{m}2 to 1^{m}5), and was the limit of navigation for ordinary steam launches. The large market town of Shih-kou-hsü (Shekkow), at the entrance of the bamboo country, 7 miles above Ssu-hui, is the chief centre of trade in the district.

It is stated that ordinary boats can reach Huai-chi (Waitsap), 89 miles up this river from San-shui.

Chart 3218, plan of Linchow Kong.

Hsiao-pei chiang.—This river, the mouth of which is described on page 570, rises in the north-western corner of Kwangtung province, and flows for about 90 miles through a mountainous country.

The principal towns on the river are Lien-hsien (Linchow) (*Lat. 24° 50′ N., Long. 112° 37′ E.*), a prefectural city, situated in a fertile plain, and the centre of trade in north-western Kwangtung; Yangshan, a district city; Taiwan and Han-kuang, the latter being a large likin station with a bridge of boats.

Charts 2661a, 1263.

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Chart 3218, plan of Linchow Kong.

There are mission stations along the river, and at Lien-hsien.

Vessels can ascend the Hsiao-pei chiang without difficulty for about 8 miles to the first rapid, the breadth of the river being about 250 yards (228^{m}6), and the banks lined with thick bamboos, behind which rise well-wooded hills.

H.M.S. *Moorhen*, with a draught of 2½ feet (0^{m}8), endeavoured, in 1903, to ascend the Hsiao-pei chiang, presumably at high river, but only got 20 miles up, owing to the tortuousness and narrowness of the channel.

Chart 3218.

Hsi shui.—The Hsi (Wu) shui, which joins the Pei chiang at Ch'u-chiang (page 571), leads to Lo-ch'ang; it is impeded by rapids, and is navigable only by shallow-draught junks.

Charts 2661a, 3522, 1263.

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CHAPTER XIII

THE CHU CHIANG, WITH ITS TRIBUTARIES, AND THE APPROACHES THERETO

Chart 1180.

GENERAL REMARKS.—The approach to the estuary of the Chu chiang, or Canton river, lies between Macao island and others southward of it, on the western side, and Lantao (page 460), on the eastern side. Wanshan chuntao (page 457) lie in the southern approach, and Chiapeng chuntao (page 455) and Lima chuntao (page 456), with other islands north-westward of them, lie in the south-eastern approach.

Tahsi shuitao (*see* below), in parts of which the depths are not greater than 4 fathoms (7m3), leads into the estuary on the western side of the approach; Lantao channel (page 580), which is deep, leads into the estuary between Lantao and the islands situated southward and south-westward of it. The estuary can also be approached from the western end of Hong Kong harbour (page 480) through Rambler channel, Kap shui mun, and a channel which passes northward of Lantao.

Pilots.—Pilotage is compulsory for all merchant vessels of over 100 tons to Canton. They may be obtained at Hong Kong, or they will meet in-coming vessels at Ta-ch'an wan (page 592). Pilot vessels are white motor launches displaying International Code flag R.

Climate and weather.—*See* page 36.

TAHSI SHUITAO.—Lights.—Tahsi shuitao or Great West channel is entered between Apomi point (*Lat. 22° 05′ N., Long. 113° 33′ E.*), the south-eastern extremity of Ta-heng-ch'in (page 453), and Hsiaoputai (page 457), the westernmost of Wanshan chuntao.

Tatou chou or Tai lo, 550 feet (167m6) high near its north-western end and sloping a little eastward, is the southernmost of a group of islets lying on the eastern side of Tahsi shuitao, and is situated about 5¼ miles north-eastward of Hsiaoputai; this group of islets is separated from Wanshan chuntao by a channel 2¾ miles wide, which is clear of dangers except for Lianglieh Pai (page 457), close off the northern end of Talieh (page 457).

Ta Lu or Tai lok, about half a mile northward of Tatou chou, is a rocky islet, 318 feet (96m9) high, with a large rock on its summit. Talupai or Bird rock, 49 feet (14m9) high, lies about 3 cables northward

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Chart 1180.

of Ta Lu; a rock, with a depth of less than 6 feet (1m8) over it, lies close north-eastward of Talupai. Hsilu or Sai lok, 167 feet (50m9) high, with Ellis rock, 80 feet (24m4) high, 2 cables eastward, lies about 6 cables northward of Ta Lu.

Sanchiao Shan or Sam kok, about one mile northward of Ta Lu, is 388 feet (118m3) high and rugged. On its northern side there is a small cove which is only suitable for boats; a bank, with depths of less than 3 fathoms (5m5) over it, extends about half a mile from the northern end of this island, and a rock, 5 feet (1m5) high, lies about one cable off its southern side.

The channels between Ta Lu and Sanchiao Shan are narrow, and the eddies are so strong that they should not be attempted.

Ch'ing chou or Chung chau si, the northernmost island of this group, lies about 1½ miles north-north-eastward of Sanchiao Shan and is 346 feet (105m5) high. A shoal, with a depth of 3 fathoms (5m5) over it, lies about one mile north-north-eastward of Ch'ing chou.

Chihtan or Chuk tu aan, 273 feet (83m2) high, lies about 3 miles east-north-eastward of Ta Lu; a rock, above water, lies about one cable north-westward of this island. Four-feet rock is a pinnacle, which is awash, lying about 1½ miles north-north-eastward of Chihtan.

La sa wei, an island lying about 2¾ miles eastward of Chihtan, together with the islands north-westward of it and Chihchou chuntao, eastward of it, are described on page 580.

On the western side of Tahsi shuitao, between a point, close off which are two rocks above water situated about one mile northward of Apomi point (*Lat. 22° 05′ N., Long. 113° 33′ E.*), and a point about 1½ miles north-westward, there is a shallow bay in the north-eastern side of Ta-heng-ch'in. De Coloane (Colowan, or Ko ho island), 745 feet (227m1) high, lies close off the last-mentioned point, separated from Ta-heng-ch'in by Hai mun; this island is connected with the eastern end of Hsiao-heng ch'in (page 530) by a bank which dries from one to 3 feet (0m3 to 0m9).

The depths in the area indicated on the chart about 3 miles eastward of Apomi point, and those about 4 miles north-eastward of Ko ho point, the eastern extremity of De Coloane, were reported, in 1910 and 1909, respectively, to be considerably less than charted.

A light is exhibited, at an elevation of 14 feet (4m3), from No. 9 beacon, an iron structure with a concrete base, on a point on Ta-heng-ch'in abreast the south-western extremity of De Coloane.

A light is exhibited, at an elevation of 188 feet (57m3), from a masonry structure situated on Ko ho point. *See* view facing page 61.

Tidal streams.—The ebb tidal stream sets strongly in a southerly direction along the western side of Tai lo and the other islands of the same group, and the flood tidal stream sets generally in a north-westerly direction, though with many eddies off the salient points.

Chart 2212, plan of Macao harbour.

MACAO.—Macao, a Portuguese settlement, is situated on the western side of Tahsi shuitao, close eastward of Lappa island, and on a peninsula at the south-eastern end of Macao island. The peninsula is connected with the island by a low, narrow, sandy isthmus. Guia

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Chart 2212, plan of Macao harbour.

fort, with its lighthouse (*Lat. 22° 12′ N., Long. 113° 33′ E.*), occupies the summit.

The population in 1948 was about 222,000.

Macao harbour, which is entered between Ko ho point and a point on Macao island, about 6¾ miles northward, is constructed on the south-eastern side of the peninsula, and there is an inner port between the peninsula and Lappa island.

There are three radio masts on a hill about half a mile north-eastward of Guia fort.

Light.—Signal station.—A light, No. 20, is exhibited, at an elevation of 353 feet (107m6), from a white circular tower with a red lantern, 44 feet (13m4) in height, on Guia fort. There is a signal station and some yellow dwellings near the lighthouse. *See* view facing page 61.

Tai pa channel.—Danger.—Light-beacon.—Tai pa channel is entered from eastward between Ko ho point and Ponta Cabrita, the north-eastern extremity of Ilha da Tai pa, about 2 miles north-north-westward. Kai kiong, an islet, 36 feet (11m0) high, lies on the northern side of the entrance, and about one cable offshore.

Ilha da Taipa (Tai pa) consists of two parts, the eastern of which is 525 feet (160m0) high, connected by a sand ridge. A drying mudbank extends about half a mile from the south-eastern side of the island. In 1934, land was being reclaimed on the south-eastern side of the western portion.

The drying bank which connects De Coloane and Hsiao-heng ch'in, forms the south-western side of Tai pa channel. At its north-western end, the channel enters Canal Sul da Rada between the western end of Ilha da Taipa and Ponta Dom João, the north-eastern extremity of Hsiao-heng ch'in about 6 cables westward; a bank, which dries from 2 to 6 feet (0m6 to 1m8), extends about 3 cables eastward from Dom Ponta João.

Pedra da Meio, a drying rock, lies about 2½ cables eastward of Ponta Dom João, and is marked by No. 8 light-beacon.

Macao roadstead.—Dangers.—Macao roadstead, which is shallow and liable to silt, lies between Ilha da Taipa and Macao harbour. A spit, which dries one foot (0m3), extends 2½ miles eastward from Malau chau; Canal Sul da Rada, leading to Malau chau pass (page 579), lies on the southern side of this spit, and Canal Norte da Rada on the northern side.

Malau chau (*Lat. 22° 10′ N., Long. 113° 31′ E.*) consists of two islands lying close together, about 2 cables off the south-eastern end of Lappa island, to which they are connected by a drying bank. There is a Custom house on the northern island, and an islet lies close off the eastern side of the same island.

Chart 1180.

The coastal bank, with depths of less than 3 fathoms (5m5) over it, fronting Macao roadstead, was reported, in 1909, to have extended about three-quarters of a mile in a south-easterly direction. Vessels drawing more than 14 feet (4m3) should not bring Ko ho point to bear less than 225°.

Chart 2212, plan of Macao harbour.

Pedra Franklin, which dries, and the position of which is doubtful, lies about 7 cables north-eastward of Ponta Cabrita.

Charts 3588, 3026, 2562, 2661a, 2661b, 1262, 1263.

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Chart 2212, plan of Macao harbour.

Pedra d'Areca, which dries, lies on the southern side of Canal Norte da Rada, about 4 cables south-eastward of the south-western extremity of the peninsula on which Macao is situated.

Chart 1180.

Anchorage.—There is anchorage in the approach to Macao roadstead with Guia fort lighthouse bearing 281°, distant from 7 to 8 miles, in a depth of about 4 fathoms (7m3), mud.

Chart 2212, plan of Macao harbour.

Macao harbour. — Lights. — Beacons. — Light-buoy.—The harbour is enclosed by moles on its eastern, southern and western sides.

There are several mooring buoys in the harbour for vessels not exceeding 3,000 tons and 400 feet (121m9) long.

A channel, in a north-westerly direction, has been dredged to the entrance to the harbour. An extension from the southern end of the eastern mole, about one mile long, lies on the north-eastern side of this channel, and a detached mole, about half a mile long, lies on the south-western side. In 1946, the channel had silted and there was a depth of only about 1½ feet (0m5).

Close southward of the entrance to the harbour, and connected with the inner end of the above-mentioned dredged channel, another channel, Canal Norte da Rada, has been dredged in a west-south-westerly direction towards the entrance of the inner port. The depth in this channel was reported, in 1935, to be 6 feet (1m8).

The inner port is entered between Barra fort, situated nearly 1½ miles south-westward of Guia fort, and the south-eastern end of Lappa island, about half a mile westward. The western side of the inner port is encumbered with sandbanks, but in 1948, there was a depth of 12 feet (3m7) close off the town. Dredging is constantly in progress to maintain the depths in the inner harbour and the main channel.

There is a small Naval yard about 1¾ cables northward of Barra fort with a tidal basin, and close northward of the Naval yard there is a pier. There are three wharves with T-heads about 6½ cables above the Naval yard.

Leading lights mark the axis of the dredged channel into the harbour. The front light is exhibited from No. 18 beacon, a white iron framework structure, situated on the wharf, about 3 cables eastward of Guia fort (*Lat. 22° 12′ N., Long. 113° 33′ E.*). The rear light is exhibited from No. 19 beacon, a white iron structure, with a concrete base, about 1¾ cables north-westward of the front light.

Lights are exhibited, at elevations of 17 feet (5m2), from two concrete beacons, Nos. 1 and 2, marking the north-eastern and south-western sides, respectively, of the entrance to the dredged channel leading into the harbour. Thence, the starboard side of the dredged channel, entering, is marked by Nos. 3 and 5 light-beacons, and the port side by No. 4 light-beacon.

A light-buoy, No. 3A, exhibiting a *red flashing* light of *one second* duration *every five seconds*, is moored on the south-western side of the channel abreast No. 3 beacon.

No. 6 light-beacon and No. 7 beacon mark the eastern and western sides, respectively, of the entrance to the harbour from the dredged channel. No. 17 beacon marks the north-eastern extremity of the breakwater protecting the eastern side of the harbour.

The starboard side of the entrance to Canal Norte da Rada, entering,

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Chart 2212, plan of Macao harbour.

is marked by No. 8 concrete beacon ; the southern side of the entrance to this channel is marked by No. 9 light-beacon, a concrete structure on a concrete base, from which a light is exhibited at an elevation of 17 feet (5m2).

No. 10 beacon marks the western extremity of the southern mole of the harbour.

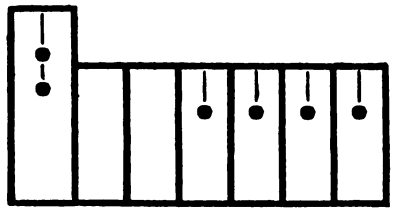
No. 11 light-beacon, a concrete structure, from which a light is exhibited, at an elevation of 17 feet (5m2), stands on the northern side of the channel and marks the western extremity of Canal Norte da Rada.

No. 12 light-beacon, a concrete structure on a concrete base, from which a light is exhibited, at an elevation of 17 feet (5m2), situated about 3½ cables west-south-westward of No. 11 light-beacon, marks the south-western side of the entrance to the inner harbour.

No. 13 light-beacon, from which a light is exhibited, at an elevation of 17 feet (5m2), is a concrete structure on a concrete base, marking Pedra d'Areca.

Tidal signals.—Tidal signals are displayed from a board close to the front leading light for the dredged channel to the new harbour. The signal consists of a number of black spheres displayed on a white framework structure. The right-hand sphere indicates 1 metre. Each of the other single spheres indicate 0·5 metres. The left-hand stand is capable of carrying two or more spheres, and the spheres hoisted on this stand indicate 0·1 metres. *See* diagram.

EXPLANATION OF TIDAL SIGNALS



The spheres displayed on the framework structure as above indicate that the height of the water above datum is 2·7 metres, or about 9 feet.

Regulations.—The navigation of the dredged channel is subject to the regulations established by the Administrative Council of the port of Macao (*Lat. 22° 12′ N., Long. 113° 33′ E.*).

Pilotage is compulsory for vessels entering the port or channels.

Vessels making use of the channels during daylight shall carry at the mast two black spheres, disposed vertically, and by night two *green* lights, disposed vertically, shall be exhibited from the extremity of the yard arm.

No vessel may anchor in the fairway of any channel.

When dredging is in progress in the channel, an approaching vessel should sound one long blast which will be answered from the dredger by four long blasts when her mooring wires have been sufficiently eased to permit the vessel to pass in safety.

Vessels are forbidden to discharge ashes, ballast or other material into the river, fairway, anchorages or roadsteads.

Charts 3588, 1180, 3026, 2562, 2661a, 2661b, 1262, 1263.

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Chart 2212, plan of Macao harbour.

Deratisation.—Deratisation can be carried out, and Deratisation and Deratisation exemption certificates issued at Macao.

Town.—Harbour facilities.—The town of Macao is situated on the slopes of the hills, which are from 200 to 300 feet (61^{m}0 to 91^{m}4) high.

A small quantity of coal and fuel oil is kept in stock. Coal is supplied by junks to vessels anchored in the inner port.

Fresh water can normally be supplied by water boats fitted with motor pumps, but, in 1946, the supply was temporarily suspended.

Tugs and lighters are available. Repairs can be undertaken by the Naval yard.

Communication.—Macao is connected to the general telegraph system.

There is a radio station at Macao. *See* page 28.

There is frequent communication by steamer with Hong Kong and Canton.

Signals.—Vessels requiring the water boat should display flag A of the International Code of Signals.

Vessels requiring an ash boat should display flag Z of the International Code of Signals.

Time signal.—A visual time signal is made, by means of electric lights, from the western corner of the roof of the observatory. For details, *see* Admiralty List of Lights and Visual Time Signals, Volume 6.

Trade.—The principal exports are tea, matches, tobacco and preserves.

Directions.—Vessels should not enter Macao harbour without recent local knowledge.

There are no dangers outside the harbour for vessels that can enter, with the exception of Pedra Franklin. Guia fort lighthouse, bearing 303°, will lead to the entrance of the dredged channel, whence a vessel should keep the leading light-beacons, and a vertical white stripe on the face of the cliff between them, marking the axis of that channel, in line bearing 306°. Care must be taken to adhere rigidly to the alignment.

If proceeding to the inner port, proceed through the dredged channel, as directed above, until about 1½ cables from the entrance to the harbour, when Malau chau Custom house, bearing 252°, leads through the western channel; when abreast the south-western end of the peninsula, a vessel can haul up for the entrance into the inner port, passing about one cable off Barra fort (*Lat. 22° 11′ N., Long. 113° 32′ E.*).

Attention is necessary to the tidal streams, which run strongly across the outer entrance of the dredged channel.

Chart 2562.

Inshore channels.—Danger.—Buoy.—Malau chau pass leads from the western end of Canal Sul da Rada (page 576), between Malau chau and Lappa island, on its northern side, and Hsiao-heng ch'in and Ta kang (Mong chau) on its southern side, into The Broadway.

This passage is used by junks and fishing vessels. A rocky patch, over which there is a depth of 3 feet (0^{m}9), lies nearly in mid-channel, about 6 cables south-westward of Malau chau, and is marked, on its north-eastern side, by a conical buoy, painted with black and red chequers and surmounted by a black globe.

From a position 1½ cables northward of Pedra da Meio a vessel should steer for the islet lying about 2 cables northward of Ta kang,

Charts 3588, 1180, 3026, 2661a, 2661b, 1262, 1263.

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Chart 2562.

bearing about 260°. The passage northward of the rocky patch is the better of the two. When within 2½ cables of Ta kang, she should steer about 310° for the western end of the fishing stakes extending from Ma on shan and into The Broadway, taking care to avoid shoal water on the southern side of the channel, until the fishing stakes are reached.

Chart 3588.

A passage, regularly used by the Macao passenger towing junks and available for shallow-draught vessels, connects the northern end of the inner port of Macao with The Broadway, entering that channel, eastward of Teng lung chau and about 6 miles northward of Ta kang. This passage is shorter than Malau chau pass, and especially useful in strong easterly winds; the eastern end of this channel is obstructed by a sunken wall which extends from the northern extremity of Lappa island.

Chart 1180.

LANTAO CHANNEL.—Light.—This channel, which leads into the estuary of the Chu chiang from southward, lies between the Soko islands and the south-western end of Lantao, on its north-eastern side, and Chi chau, La sa wei, and Chung chau, on its south-western side, and is nearly 2 miles wide in its narrowest part. The channel is clear of dangers. The approach to the south-eastern end of Lantao channel is the same as that for the western entrance to Hong Kong harbour, which is described on pages 480-482.

Tathong channel (page 474), Taitam wan (page 473) and East Lamma channel (page 465) afford shelter in a typhoon, if an anchorage is gained before night.

Vessels approaching this channel from eastward should pass southward of Po toi (page 471) and northward of Wailingting (page 459), giving a wide berth to the drying rocks lying about three-quarters of a mile north-eastward of the latter island.

Lantao channel is entered from south-eastward between Chi chau, about 7 miles westward of Wailingting and the south-easternmost of the Soko islands, about 2¼ miles north-eastward.

Tachih chou or Chi chau (*Lat. 22° 07′ N., Long. 113° 54′ E.*) is 824 feet (251m2) high and is inhabited; a rock, awash, lies about 1½ cables northward of the eastern extremity of the island, and a rock above water lies close off its south-western extremity. Hsichih chou or Si Chi chau, 358 feet (109m1) high, lies about a quarter of a mile westward of Chi chau.

La sa wei or Laframi, 768 feet (234m1) high, and inhabited, lies about 2 miles west-north-westward of Hsichih chou. Chenhsiangwei or Rocky islet, 211 feet (64m3) high, lies on the southern end of a bank which extends about one mile southward from the eastern extremity of La sa wei. There is a rock above water and a rock, awash, between the northern end of Rocky islet and the eastern extremity of La sa wei.

The channel between Chenhsiangwei and Hsichih chou is safe, and can be used by vessels bound for the Chu chiang when approaching from southward. For Tungtou shih and Sanya Pai, on the western side of the approach to this channel, *see* page 458.

Chunghsin chou or Nau tau, 438 feet (133m5) high, lies close northward of La sa wei, with depths of less than 3 fathoms (5m5) between.

Charts 3026, 2212, 2661a, 2661b, 1262, 1263.

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Chart 1180.

Niutou or Chung chau, 464 feet (141m4) high at its northern end, lies north-westward of Chunghsin chou, separated from it by Nioutou men or Nautau, a passage about 2 cables wide. A rock, with a depth of 2¾ fathoms (5m0) over it, lies on the northern side of the western approach to Nioutou men about 2 cables off the south-western side of Niutou; this rock is situated on a bank, with depths of less than 5 fathoms (9m1) over it, which extends about three-quarters of a mile from the south-western side of Niutou. For Four-feet rock, about 2 miles south-westward of Niutou, *see* page 575. There is a boat cove on the north-eastern side of Niutou; close off its north-western extremity is an islet, 210 feet (64m0) high, with a large rock on its summit.

On the north-eastern side of Lantao channel, the Soko islands lie on the southern end of a bank, with depths of less than 5 fathoms (9m1) over it, which extends about 3½ miles south-eastward from the western part of the southern side of Lantao; for the eastern part of the southern side of Lantao, *see* page 460.

Tai a chau, the southern of the Soko islands, which rises steeply to an elevation of 501 feet (152m7), lies about 2 miles north-north-eastward of Tachih chou; a rock, with a depth of less than 6 feet (1m8) over it, lies about 2 cables off the northern extremity of the island. An islet, 130 feet (39m6) high, with a sunken rock close southward of it, lies about half a mile south-eastward of Tai a chau.

Siu a chau, 400 feet (121m9) high, the northern of the Soko islands, lies about half a mile northward of Tai a chau. An islet, 154 feet (46m9) high, lies about 2 cables eastward of Siu a chau, and a sandspit, with a least depth of 1¼ fathoms (2m3) over it, extends about 1¾ miles from its western side; a rock, which dries 4 feet (1m2), lies close off the north-eastern side of the same island. Three rocky islets, the highest of which has an elevation of 117 feet (35m7), lie between the western ends of Siu a chau and Tai a chau.

Between the south-western extremity of Lantao and the rounded point (page 460), about 5 miles eastward, there is a shallow bight in the southern coast of Lantao.

A light is exhibited, at an elevation of 70 feet (21m3), from a column, 22 feet (6m7) in height, on the south-western extremity of Lantao. The cliff in the vicinity of the light-structure is whitewashed.

Tidal streams.—The ebb stream runs through Lantao channel strongly with many eddies, particularly in July and August, when its rate is sometimes 4½ knots at springs.

Between Niutou (*Lat. 22° 10′ N., Long. 113° 48′ E.*) and Lantao there are strong eddies.

Chart 3632.

CHANNELS FROM HONG KONG TO THE CHU CHIANG.— Kap shui mun. — Lights. — Fog signal. — Dangers. — Light-buoy.—Kap shui mun is approached from southward by West Lamma channel and from eastward from the western entrance of Hong Kong harbour. The channel lies between the north-eastern end of Lantao and Tsing island (page 583), and is divided into two, at its north-western end, by Ma wan; the eastern of these two channels is wide, and the western, narrow. The latter is almost invariably used as it is shorter than the eastern, and it is only necessary to keep in mid-

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Chart 3632.

channel. The tidal streams (page 586) attain nearly the same rate, from 3 to 5 knots, in both channels.

At its north-eastern end, Kap shui mun joins the channel leading from the northern end of Rambler channel (page 583) towards the eastern side of the estuary of the Chu chiang.

Between the south-western entrance point of Kap shui mun (page 464), close off which are some rocks, which dry from one to 4 feet (0m3 to 1m2), and a point 9 cables northward, the western side of the channel is indented by two shallow bays, divided from one another, about midway, by an islet, 25 feet (7m6) high, connected with the coast by a drying bank about half a cable wide. Rocks, which dry from one to 6 feet (0m3 to 1m8), lie close off the islet.

Bunsansiah rock lies on the western side of the fairway of the southern part of Kap shui mun, about 6½ cables eastward of its south-western entrance point. It is a pinnacle, awash, with depths of from 6 to 8 fathoms (11m0 to 14m6) at a short distance.

A light-buoy, painted in red and white chequers, and exhibiting a *white flashing* light *every three seconds*, is moored about one cable eastward of Bunsansiah rock.

The western channel of Kap shui mun is entered between the point situated 9 cables northward of the south-western entrance point of Kap shui mun and Tang lung chau, 121 feet (36m9) high, about 3 cables north-eastward. Tang lung chau is surrounded by foul ground; a bank, which dries, extends a short distance from its north-eastern side; near the outer edge of this bank there is a rock, 15 feet (4m6) high.

A light is exhibited, at an elevation of 124 feet (37m8), from a white framework tower, 28 feet (8m5) in height, on the summit of Tang lung chau.

A fog signal is sounded from the south-western extremity of the island.

A rocky shoal, with a depth of 1½ fathoms (2m7) over it, lies about one cable south-eastward of Tang lung chau.

Ma wan, an island, 213 feet (64m9) high at its southern end, lies about 1¼ cables northward of Tang lung chau, the channel between being shallow and foul.

Between the southern extremity of Ma wan and a point about 3 cables north-westward, the south-western side of Ma wan is fairly steep-to, with rocks above water lying close off the northern part of this stretch of coast. Between the last-mentioned point and the western extremity of the island, about 2 cables west-north-westward, there is a shallow bight in which is a stone pier; the fishing village of Ma wan stands along the northern side of this bight.

A light is exhibited, at an elevation of 50 feet (15m2), from a grey column on a white hut, situated near the western extremity of Ma wan.

Between the western extremity of Ma wan (*Lat. 22° 21′ N., Long. 114° 03′ E.*) and its north-western extremity, about 4 cables north-north-eastward, there is a bay; rocks above water lie close off the south-eastern shore of this bay, and a bank, with depths of less than 3 fathoms (5m5) over it, extends about three-quarters of a cable from the head of the bay.

The south-western side of this portion of Kap shui mun, between its south-western entrance point and the northern extremity of Lantao,

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Chart 3632.

about one mile north-westward, is fringed by a reef and a narrow coastal bank. About 4 cables south-eastward of the northern extremity of Lantao there is a shallow bay, the head of which dries.

On the eastern side of the eastern channel of Kap shui mun, Tsing island is hilly, and rises at its southern end to an elevation of 1,091 feet (332^{m}5), the northern end being 709 feet (216^{m}1) high ; a neck of land, a little over 300 feet (91^{m}4) high, divides the northern and southern portions. Between the south-western extremity of Tsing island and its north-western extremity, about 2 miles north-north-westward, the eastern side of Kap shui mun is indented ; the salient points are, however, steep-to, and may be passed at a distance of one cable.

On the western side of the eastern channel of Kap shui mun, a bank, with depths of less than 5 fathoms (9^{m}1) over it, extends nearly 1½ cables eastward from Tang lung chau. The eastern side of Ma wan consists of sandy beaches and rocky points, with shoals and foul ground extending off the latter for as much as 1½ cables.

A shoal, with a least depth of 4½ fathoms (8^{m}2) over it, lies 2½ cables eastward of the south-eastern extremity of Ma wan.

A spit of foul and rocky ground extends 1½ cables eastward from the north-eastern extremity of Ma wan ; at the outer end of this spit there is a group of rocks, which dries 6 feet (1^{m}8). Boats and small craft should not approach the spit too closely when rounding the point during the ebb tide, as the tidal stream sets strongly over it.

Dumping ground.—A disused dumping ground for explosives is indicated by pecked lines on the chart extending westward from the south-western end of Tsing island.

Regulations.—Navigation is prohibited in both branches of Kap shui mun and in Rambler channel between half an hour after sunset and half an hour before sunrise. Should special circumstances warrant a departure from this regulation, permission must be obtained from the Naval authorities.

Rambler channel.—Dangers.—Buoy.—Beacons.—Rambler channel connects Hong Kong harbour with the estuary of the Chu chiang, but is a longer and more difficult passage than Kap shui mun, and is not recommended except for small craft, as the tidal streams, especially the south-going stream, sets strongly through, and it is much frequented by junks. The entrance is described on page 464.

On the western side of Rambler channel, a rock (*Lat. 22° 20′ N., Long. 114° 06′ E.*), 10 feet (3^{m}0) high, lies close off the south-eastern extremity of Tsing island. Between this point and the southern entrance point of Tsing island bay, about 1½ miles northward, the eastern side of Tsing island is fringed by a narrow coastal bank, and depths of less than 6 fathoms (11^{m}0) extend nearly 3 cables offshore in places at the southern end.

On the eastern side of Rambler channel, an islet, 92 feet (28^{m}0) high and connected with the mainland by a drying reef, lies about 4½ cables north-westward of the 7-foot (2^{m}1) high islet mentioned on page 481. The coastal bank between these two islets extends about 1½ cables offshore with depths of less than 3 fathoms (5^{m}5) over it.

Lap sap wan, or Gin Drinkers bay, is entered between the 92-foot (28^{m}0) high islet and a point about 7 cables north-north-westward.

Tsing chau, or Pillar island, 167 feet (50^{m}9) high, lies nearly midway between the entrance points of Lap sap wan and about 2½ cables from

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Chart 3632.

the western shore of Rambler channel. An isolated rock, 4 feet (1m2) high and steep-to on its south-western side, lies on the edge of a bank, with depths of less than 3 fathoms (5m5) over it, which extends about half a cable from the south-western side of Tsing chau. A detached patch, with a depth of 2¾ fathoms (5m0) over it, lies about three-quarters of a cable off the north-western extremity of Tsing chau, and a rock, which dries, lies nearly half a cable off the north-eastern extremity of the island, with two rocks above water between.

Lap sap wan is shallow; a drying bank extends about a quarter of a mile from its head where a small stream discharges into it. On the eastern side of this stream there are some villages, eastward of which the land rises steeply to Golden hill, 1,207 feet (367m9) high, situated about one mile inland.

A bank, with depths of less than 3 fathoms (5m5) over it, extends about one cable from the northern entrance point of Lap sap wan; on the bank there is a rock, 9 feet (2m7) high, and other rocks, the outermost of which dries 3 feet (0m9).

Between the northern entrance point of Lap sap wan and a point, 25 feet (7m6) high, about half a mile north-westward, there is a shallow bay, most of which dries, and from the northern side of which a pier extends about half a cable.

Channel rocks, one of which dries 6 feet (1m8), lie near the northern end of a patch of shallow and foul ground situated on the eastern side of the northern end of the channel. The northern end of this patch is situated about 1½ cables southward of the last-mentioned point. The patch is almost steep-to on its western side, and is separated from the reefs on the western side of Rambler channel by a channel about one cable wide.

Two beacons, each consisting of a pole, painted in black and white chequers, surmounted by a black triangle, are situated on the western side of Channel rocks and on the point about 2 cables northward, respectively.

On the western side of Rambler channel, Tsing island bay is entered between its southern entrance point (page 583) and a point about 2 cables north-westward. This bay almost completely dries, and a group of rocks, which dries 6 feet (1m8), lies on a shoal in its approach, about three-quarters of a cable northward of its southern entrance point.

Ngai ying chau, or Cap island (*Lat. 22° 22′ N., Long. 114° 06′ E.*), 106 feet (32m3) high, lies close off the north-eastern end of Tsing island, separated by a shallow channel; Mang tsai tong, a shallow harbour, which is usually crowded with junks in bad weather, is situated at the northern end of this channel.

A beacon, consisting of a pole, painted in red and white chequers, surmounted by a red rectangle, stands on the south-eastern extremity of the reef extending about three-quarters of a cable south-eastward from Ngai ying chau.

A 3¼-fathom (5m9) patch and a 4¼-fathom (7m8) patch, the latter marked by a can buoy, painted in red and white chequers, on its northern side, lie about one cable and 1½ cables, respectively, north-eastward of the north-eastern extremity of Ngai ying chau.

At its northern end, Rambler channel leads into Tsun wan.

For tidal streams in Rambler channel, *see* page 587.

Charts 3681, 1180, 3026, 1962.

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Chart 3632.

Tsun wan.—Dangers.—This bay lies at the eastern end of the channel leading from Rambler channel into the estuary of the Chu chiang; its north-western entrance point is situated about 3 cables north-north-westward of the northern extremity of Tsing island.

A considerable portion of the head of the bay dries, and, in 1951, the northern part was being reclaimed; a shoal, with a least depth of 1¼ fathoms (2m3) over it, lies nearly in the middle of Tsun wan and about 7 cables eastward of its western entrance point, and a rock, with a depth of less than 6 feet (1m8) over it, lies, about 5 cables north-eastward of the same point, on a spit, which extends from the northern shore of the bay.

The village of Tsun wan is situated between the streams which discharge into the head of the bay.

The land northward of Tsun wan rises steeply, and, at a distance of 2¾ miles in that direction, is Tai-mo-shan (chart 1180), 3,137 feet (956m2) high, the highest peak in this vicinity.

Anchorages.—Tidal streams.—There is good anchorage in Tsun wan, northward of Ngai ying chau, in depths of from 6 to 8 fathoms (11m0 to 14m6), mud.

In the south-eastern part of the bay there is good anchorage for small craft, in depths of from 2 to 4 fathoms (3m7 to 7m3), but it is difficult of access, being usually crowded with junks in bad weather, or on the first approach of a typhoon.

In this latter anchorage there is very little tidal stream, but in the middle of the bay the ebb runs eastward and south-eastward at a rate of 2½ knots at springs; the flood stream, however, is a good deal weaker, and at times is inappreciable.

Dangerous goods anchorage.—There is a dangerous goods anchorage in Tsun wan, bounded on the north and east by the mainland, on the west by a line drawn 000° from the north-western extremity of Ngai ying chau, and on the south by a line drawn 090° from the southern extremity of the same island.

Storm signals.—When local storm signals are displayed at Hong Kong, supplementary signals are displayed at Tsun wan police station, *see* page 498.

Channel into the Chu chiang estuary.—From the northern end of Rambler channel, a channel leads in a westerly direction to the eastern side of the estuary of the Chu chiang between the mainland, on the northern side, and the northern ends of Tsing island, Ma wan, and Lantao, on the southern side. The coast of the mainland may be approached within one cable in places.

On the southern side of the channel, between the northern extremity of Tsing island (*Lat. 22° 22′ N., Long. 114° 06′ E.*) and a point about 6 cables westward, there is a shallow bight, from the shores of which a bank, with depths of less than 3 fathoms (5m5) over it, extends about one cable.

On the northern side of the channel, Ting kau, a village, stands at the head of a small, sandy bay situated about one mile westward of the north-western entrance point of Tsun wan. A bank, with depths of less than 5 fathoms (9m1) over it, extends about a quarter of a mile from the north-eastern shore of this bay, and, in the fairway of the channel, farther south-westward, is a similar bank, on the northern edge of which is a shoal, over which there is a least depth of 3 fathoms

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Chart 3632.

(5m5), situated about 1½ cables southward of the western entrance point of the sandy bay; between the southern edge of the last-mentioned bank and the north-western end of Tsing island there is a deep channel about one cable wide.

Pak shek kiu, a mountain, 1,544 feet (470m6) high and surmounted by a few large boulders, rises steeply from the northern shore, and is situated about 8 cables north-north-eastward of Ting kau.

About one cable south-westward of Ting kau there is a fairly prominent hill, 138 feet (42m1) high, the summit of which is cultivated; from this hill the coast trends half a mile west-south-westward to a rounded, steep, and rocky point, whence it trends west-north-westward for 4 cables to a shallow, sandy bay, a considerable portion of the head of which is reclaimed land. A pier extends from the eastern part of the reclaimed land a short distance beyond the edge of the coastal bank.

About 9 cables west-south-westward of the pier is the eastern entrance point of another sandy bay, in which shoal water extends about one cable offshore.

From the western entrance point of the latter bay, the coast is bold and steep-to as far as Brothers point, about one mile westward. The hills, inland, are barren and are covered with large boulders.

On the southern side of the channel, the northern coast of Ma wan (page 582) is fairly steep-to; there is a sandy bay in the eastern part of this coast, off the western entrance point of which a spit, with depths of less than 3 fathoms (5m5) over it, extends about half a cable offshore.

Between the northern extremity of Lantao (page 582) and a point about 9 cables south-westward, there are two shallow bays, divided from one another by a narrow projection, close off which is a rock, 5 feet (1m5) high. Between the south-western entrance point of the south-western of these two bays and a point, about 6 cables west-south-westward, there is another shallow bay, at the head of which is a drying bank; a bank, with depths of less than 5 fathoms (9m1) over it, extends about 8 cables north-north-eastward from this drying bank. The north-eastern end of this bank lies about 1¾ cables off the eastern entrance point of the bay.

A grassy island, 84 feet (25m6) high and fringed by a narrow reef, lies close off the western entrance point of the last-mentioned bay; it is connected by a drying bank which forms the head of a small shallow bay, entered between the north-western extremity of the island and a point on Lantao about 2 cables south-westward.

The eastern side of the estuary of the Chu chiang (page 589) is entered between the grassy island and Brothers point.

Rangefinder testing mast.—A rangefinder testing mast, 33 feet (10m1) in height, is situated about 2¾ miles north-eastward of Brothers point (*Lat. 22° 21′ N., Long. 114° 01′ E.*). The elevation of the top of the mast is 853 feet (260m0).

Cable area.—Beacons.—Between the northern extremity of Lantao and a point on the mainland, about three-quarters of a mile north-westward there is a cable area, indicated on the chart by pecked lines and the limits of which are marked by beacons. There is a hut near the coast at each end of the area.

Tidal streams.—The tidal streams in the vicinity of Kap shui mun are strong, and at the sides of the channels cause whirls and eddies sufficient to make small craft unmanageable.

Charts 3681, 1180, 3026, 1962.

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Chart 3632.

The ebb stream flows eastward, parallel with the land past The Brothers islets (chart 3681), increasing in rate as the channel narrows at the northern end of Lantao, where it runs at a rate of over 3½ knots at springs.

The northern portion of this stream flows between the northern coast of Ma wan and the mainland, attaining a greater rate, as much as 4¾ knots having been observed just northward of the north-eastern extremity of Ma wan. The stream divides at the north-western end of Tsing island, one part passing northward of that island and turning south-eastward and southward through Rambler channel, at a rate at springs of about 2¼ knots; the other part turning south-eastward and southward, flowing through the broad channel westward of Tsing island, at a rate of from 2¼ to 3½ knots. The latter stream is marked by tide-rips, which move through the channel and are generally found at no great distance from the Tsing island coast. At times, during the ebb, still water and occasionally a counter current northward may be found along the eastern side of Ma wan.

The southern portion of the ebb stream, after passing the northern end of Lantao, strikes the western extremity of Ma wan, and is deflected southward through the narrow channel westward of that island. In the bay between the north-western and western extremities of Ma wan, the stream runs in all directions, part northward and part recurving southward in whirls. Close north-westward of the western extremity it sets strongly towards that point, and into the little bay southward of it; farther along it sets generally directly through the channel, the greatest rate recorded being a little over 4 knots.

The flood stream in Rambler channel is weak, and at times non-existent. That through the channel between Tsing island and Ma wan is also weak compared with the ebb, running at a rate of only 1¼ knots in the centre of the channel, and of 2¾ knots in a north-north-westerly direction past the spit off the north-eastern extremity of Ma wan. The main stream of the flood probably runs westward until it strikes the eastern coast of Lantao, and is there deflected through the channel between Ma wan and Lantao, where it attains a considerable rate, as much as 5¼ knots having been recorded. It meets the weaker current flowing westward at a line joining the northern extremity of Lantao and the north-western extremity of Ma wan (*Lat. 22° 21′ N., Long. 114° 03′ E.*), but is only slightly deflected by it, and flows across in a north-north-westerly and north-westerly direction until it strikes the coast of the mainland. Here it turns westward and runs along parallel with the shore, the stream in the south-western part of the channel being but slight.

In April, 1935, H.M.S. *Falmouth* reported that, at spring tides, the north-west going stream in Kap shui mun, between Ma wan and Lantao, attained a rate of over 8 knots; a fresh easterly wind had been blowing for four days.

Chart 1180.

ESTUARY OF THE CHU CHIANG.—Western side.—Between the northern end of Macao harbour and a point about 3¼ miles north-north-eastward of Guia fort there is a shallow bay; about half a mile southward of this point there are some rocks above water.

Chiu-chou yang (Kau chau or Nine islets), a group lying close

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Chart 1180.

together, are situated eastward of the point mentioned above, the outermost, 130 feet (39m6) high, being nearly 2 miles offshore, with depths of less than 3 fathoms (5m5) extending about 3 cables farther eastward; a rock above water lies a quarter of a mile southward of the southernmost islet of the group.

There is anchorage for small craft with local knowledge, in depths of from 5 to 6 fathoms (9m1 to 11m0), between this group and the coast westward, with some shelter from the North-east monsoon. There are depths of from 2½ to 3 fathoms (4m6 to 5m5) in the approach to this anchorage, and the rock above water southward of the group forms a good mark.

Chart 3681.

Hsiang-chou wan is entered between a point, about 4½ miles north-north-eastward of Guia fort, and a point about 3½ miles farther north-north-eastward. Yehli chou lies about three-quarters of a mile north-westward of the southern entrance point of Hsiang-chou wan and a quarter of a mile offshore, with sunken rocks between; some rocks, with depths of less than 6 feet (1m8) over them, lie close off the eastern side of the island.

White rock, surrounded by sunken rocks, is situated about 1½ miles east-north-eastward of Yehli chou, with a rock, which dries 3 feet (0m9), nearly midway between.

The town of Hsiang-chou-fou is situated on the coast abreast Yehli chou.

Considerable shoaling was reported, in 1930, to have taken place in an area of which the centre lies nearly 6 miles eastward of Yehli chou.

Between the northern entrance point of Hsiang-chou wan and Tungku chiao, 3½ miles north-north-eastward, there are two shallow bights; She chou are two islets lying a short distance offshore in the southern part of the southern of these two bights.

Chinhsing men.—Dangers.—At Tungku chiao the coast turns abruptly westward and forms the southern side of an extensive and shallow bay. Chinhsing men, which is safe for small vessels, lies in the southern part of this bay, and is entered between Tungku chiao and Hong seng miu point on the south-eastern side of Chiao tao (*Lat. 22° 25′ N., Long. 113° 38′ E.*), about 525 feet (160m0) high, about 1½ miles north-eastward; Hong seng miu bay, used by junks as an anchorage, in winter, lies close south-westward of the point. An extensive bank, with a depth of less than 3 fathoms (5m5) over it, extends about 5 miles south-south-eastward, leaving a channel about three-quarters of a mile wide into Chin-hsing-men chiang, between it and the coastal bank southward of Tungku chiao. A shoal, with a depth of 4 feet (1m2) over it, was reported, in 1935, to lie on the north-eastern side of the channel, about one mile north-eastward of Tungku chiao. Within the harbour, an islet, with foul ground extending about 3 cables westward from it, lies about one mile north-westward of Tungku chiao. Half-tide rock lies at the head of the harbour, about 2½ miles west-north-westward of Tungku chiao.

Anchorage may be obtained about half a mile westward of the islet lying 2 cables off the south-western side of Chiao tao, in a depth of about 5 fathoms (9m1), soft bottom. The depths in the harbour decrease somewhat rapidly as Half-tide rock is approached.

Charts 3026, 2562, 2212, 2661a, 2661b.

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Chart 3681.

For the western side of the estuary northward of Chiao tao and the channels leading to the Hsi chiang, *see* page 593.

Chart 1180.

Eastern side of the estuary.—Coast.—Between the south-western extremity of Lantao (page 580) and Peaked hill, insulated at high water, 1¼ miles north-north-westward, the coastal bank, with depths of less than 3 fathoms (5m5) over it, extends about 4 cables offshore. A rock, 2 feet (0m6) high, lies about one mile north-north-westward of Peaked hill and 6 cables offshore.

Between a point, about 1¼ miles northward of Peaked hill and Bluff point, on which is a flagstaff, about 1¼ miles farther north-north-eastward, there are two shallow bays on the western side of Lantao. In the northern bay there is a creek which a boat can enter at high water, and the village of Tai O is situated at its head. At Tai O there is a police station and a Custom house, and the village is connected by telephone with Hong Kong.

Storm signals.—When local storm signals are displayed in Hong Kong harbour, supplementary signals are displayed at Tai O police station. *See* page 498.

Coast.—Dangers.—Light.—Between the northern side of Bluff point and Cape Fame, about three-quarters of a mile north-eastward, there is a shallow bay, and between Cape Fame and a projecting point, which forms the north-western extremity of Lantao, about 2 miles farther north-eastward, there is another shallow bay.

Chart 3681.

Valley hill (*Lat. 22° 17′ N., Long. 113° 53′ E.*) lies about one mile south-south-westward of the north-western extremity of Lantao and a short distance inland, and the village of Sha lo wan is situated about 6 cables south-eastward of the same point.

Between the north-western extremity of Lantao and Tap siak kok, the south-western extremity of a promontory on the mainland, about 5 miles north-north-eastward, is the entrance to an inlet which leads to the western end of the channel which leads to Kap shui mun and Rambler channel (page 583).

Fishing stakes exist in a position about one mile north-north-westward of Valley hill; the north-western extremity of these stakes is marked by a *white fixed* light.

An islet, 150 feet (45m7) high, with a rock, which dries 6 feet (1m8), close south-eastward, lies about three-quarters of a mile north-eastward of the southern entrance point of the inlet. Rocks, which dry 7 and 8 feet (2m1 and 2m4), lie close off the north-western point of the islet, and sunken rocks extend about one cable from the northern extremity.

Tung chung bay, which dries, is entered between a point about one mile south-eastward of the 150-foot (45m7) islet and a point about three-quarters of a mile farther east-south-eastward. The village of Tung chung is situated at the head of the bay.

Chu lu kok, an island, 406 feet (123m7) high, lies northward of Tung chung bay, about a quarter of a mile north-westward of its eastern entrance point.

In the narrow channel between Chu lu kok and Lantao there were, in 1940, depths of from 7 to 32 feet (2m1 to 9m8).

Between the north-western extremity of Lantao and a point on the northern side of that island about 6 miles east-north-eastward, a bank,

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Chart 3681.

with depths of less than 3 fathoms (5^{m}5) over it, extends offshore as far as Red point, the north-eastern extremity of Chu lu kok. Red point is 142 feet (43^{m}3) high and has a remarkable rocky appearance.

Round hill, 406 feet (123^{m}7) high, lies on the northern side of Lantao, about 2½ miles south-eastward of Red point.

Chu lu kok bank, with a least depth of 14 feet (4^{m}3) over it, lies about half a mile north-westward of Chu lu kok. Vessels using the channel between Chu lu kok bank and Sha chau (*see* below) can carry a least depth of 18 feet (5^{m}5), with Castle peak bearing 041°.

The Brothers, a group of islets, lie east-north-eastward of Red point: West Brother, or Mo to W, 212 feet (64^{m}6) high, at a distance of about 1¼ miles, and East Brother, or Mo to E, 193 feet (58^{m}8) high, about 6½ cables farther east-north-eastward. A bank, with depths of less than 3 fathoms (5^{m}5) over it, extends 4 cables from the western side of West Brother, and about 2½ cables from the eastern side. A bank, with depths of less than 3 fathoms (5^{m}5) over it, extends about 3 cables from the western side of East Brother, and there is a detached shoal, with a depth of 2½ fathoms (4^{m}6) over its southern end, close off the eastern side of the same islet. Reef islet, 30 feet (9^{m}1) high, lies about 4 cables southward of East Brother.

On the northern side of the inlet, between Brothers point (*Lat. 22° 21′ N., Long. 114° 01′ E.*) (page 586) and a point about 1½ miles westward, the coast is indented by shallow bays; an islet, 90 feet (27^{m}4) high, lies close westward of the last-mentioned point; a rock, 6 feet (1^{m}8) high, lies close southward, and a rock, with a depth of less than 6 feet (1^{m}8) over it, lies close westward of this islet.

An obstruction, with a depth of 9 feet (2^{m}7) over it, was reported, in 1951, to lie about 4½ cables southward of the islet, 90 feet (27^{m}4) high.

Castle Peak bay, which is shallow, is entered between the 90-foot (27^{m}4) islet and Pillar point, 34 feet (10^{m}4) high, about 2½ miles westward. A bank, with a depth of 19 feet (5^{m}8) over it, lies in the approach to Castle Peak bay; the western end of this bank lies about three-quarters of a mile eastward of Pillar point. Anchorage may be obtained between the western end of this bank and the coast north-westward, and between the north-eastern side of the bank and the coastal bank extending from the north-eastern side of Castle Peak bay. Shallow-draught vessels can anchor about 4 cables north-north-westward of the islet at the eastern entrance, in a depth of 2 fathoms (3^{m}7), mud.

Strong squalls are experienced in Castle Peak bay, and the tidal streams are strong.

Castle peak, 1,915 feet (583^{m}7) high, the summit of the promontory which forms the south-eastern side of Hau hoi wan (page 592), lies about 1½ miles north-north-eastward of Pillar point.

Between Pillar point and Tap siak kok (page 589) the coast is fairly steep-to at a distance of 2 cables. A rock, with a depth of less than 6 feet (1^{m}8) over it, lies close westward of Tap siak kok; between this point and Black point, about 2 miles north-north-westward, there is a bight, from the shore of which a bank, with depths of less than 3 fathoms (5^{m}5) over it, extends a short distance beyond the line joining the entrance points.

Off-lying islands.—Light.—Sha chau, 169 feet (51^{m}5) high, with

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Chart 3681.

an islet in the form of a hillock, 170 feet (51m8) high, close northward and connected to it by a drying bank, lies about 2¼ miles south-westward of Tap siak kok, near the south-eastern end of a bank, with depths of less than 3 fathoms (5m5) over it, which occupies a large portion of the centre of the estuary of the Chu chiang. Tree islet, 30 feet (9m1) high, on which there was a conspicuous tree, in 1901, lies about 8 cables north-westward of the northern end of Sha chau. A rock above water lies close off the north-western side of Tree islet, and Dulley rock, with a depth of 3 feet (0m9) over it, lies about 1½ cables westward. White rock, 7 feet (2m1) high, lies about 4 cables west-north-westward of Tree islet.

Tung kwu, an island, 245 feet (74m7) high and rocky in appearance, lies about 1½ miles northward of Sha chau. An islet, 212 feet (64m6) high, lies close southward of Tung kwu, and is connected to it by a drying bank. There are depths of less than 3 fathoms (5m5) between Tung kwu and Tree islet.

A light is exhibited, at an elevation of 280 feet (85m3), from a square granite tower, 25 feet (7m6) in height, on the summit of Tung kwu.

Urmston road.—Anchorage.—Urmston road, which is a safe and tolerably sheltered anchorage, is situated between the mainland, in the vicinity of Tap siak kok, and the off-lying islands described above. Steam vessels, bound to Canton, anchor here and off Castle Peak bay, eastward of it, at night. The best berth is with the summit of Nei-ling-ting open northward of Tung kwu lighthouse, and nearer the mainland than Tung kwu, in a depth of about 11 fathoms (20m1), where smooth water has been found during an easterly gale. The tidal streams are strong.

Nei-ling-ting.—Off-lying banks.—Nei-ling-tin, or Lintin island, rising to a conical peak, 1,110 feet (338m3) high, lies nearly in the middle of the Chu chiang estuary, about 3½ miles north-westward of Tung kwu. There is a narrow sandy beach on the southern side of the western part of Nei-ling-ting, where there is a Customs station and a flagstaff.

The island lies on the south-western side of a bank, with depths of less than 3 fathoms (5m5) over it, the extent of which can best be seen on chart 2562. On this bank are South Sand spit, South East bank, Fan-shih tui, and Ling-ting Shuan-chou.

South Sand spit, with depths of from one to 3 fathoms (1m8 to 5m5) over it, extends 4¼ miles southward from Nei-ling-ting.

South East bank, with depths of from 10 to 12 feet (3m0 to 3m7) over it, lies about 2 miles eastward of Nei-ling-ting, and depths of less than 3 fathoms (5m5) extend about 5 miles southward from South East bank.

A bank, with depths of less than 2 fathoms (3m7) over it, extends about 1¾ miles northward from Nei-ling-ting.

The southern end of Fan-shih tui, over which there is a least depth of 10 feet (3m0), lies about 1½ miles northward of Nei-ling-ting; Fan shih hsü (*Lat. 22° 30′ N., Long. 113° 48′ E.*), a rock, 61 feet (18m6) high, with White rock, 40 feet (12m2) high, about a quarter of a mile west-north-westward, is situated near the northern end of this bank, about 5 miles northward of the summit of Nei-ling-ting.

Chart 3682.

The north-western end of the bank, with depths of less than 3 fathoms

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Chart 3682.

(5m5) over it, which extends 12 miles north-north-westward from Nei-ling-ting, is known as Ling-ting Shuan-chou; near the northern end of this bank there is a patch, over which there are depths of 1½ fathoms (2m7).

Chart 3681.

There are fishing stakes, indicated on the chart, between South Sand spit and the bank extending south-eastward from Chiao tao (page 588), and also between the former and the bank extending southward from South East bank.

There is anchorage off Nei-ling-ting, about 1½ miles from the sandy beach, mentioned above, in depths of 8 fathoms (14m6); from this position the depths decrease rapidly towards the island.

Hau hoi wan.—Dangers.—Hau hoi wan, on the eastern side of the Chu chiang estuary, is entered between Black point and South-West point, the southern extremity of a peninsula, about 4 miles north-north-westward. Nan shan, 1,100 feet (335m3) high, is the summit of this peninsula. The bay is for the most part shallow.

A rock, which dries 4 feet (1m2), lies about 4 miles east-north-eastward of South-west point, and a rock, which dries 6 feet (1m8), lies 6½ miles north-eastward of Black point, and about 4 cables off the south-eastern shore.

Ch'ih wan, a shallow bay, lies at the south-western end of the peninsula mentioned above between South-west point and Green point, nearly one mile north-westward; a group of rocks, 7 feet (2m1) high, lies close southward of Green point. Between Green point and Nan tau ho, the north-western extremity of the peninsula, about one mile north-north-westward, the coast is moderately steep-to.

Charts 3681, 3682.

Ta-ch'an wan, which is shallow, is entered between Nan tau ho and a point about 5 miles north-north-westward. Three islets lie in the northern part of this bay, near the edge of the mud bank which dries and which occupies most of the bay; Maun chau, 103 feet (31m4) high, the south-westernmost, lies about one mile south-south-eastward of the northern entrance point of the bay, and Yauu chau, 206 feet (62m8) high, with Tree islet, 32 feet (9m8) high, close south-eastward, lies about 3 cables north-eastward of Maun chau. The town of Nantou is situated on the southern part of the head of the bay.

Off-lying islets.—Signal station.—Tzu chou or Ma chau (*Lat. 22° 30′ N., Long. 113° 50′ E.*) lies in the approach to Ta-ch'an wan, about 1½ miles west-north-westward of Nan tau ho. Tzu chou consists of two islets close together and connected by a shallow bank; the north-western islet is 220 feet (67m1) high, and the south-eastern, 152 feet (46m3) high. A spit, with depths of less than 3 fathoms (5m5) over it, extends about 1½ miles south-south-eastward from Tzu chou.

Ta-ch'an, 393 feet (119m8) high, lies north-eastward of Tzu chou, from which it is separated by a channel about 4 cables wide.

Ta-ch'an lies at the southern end of a spit which extends southward from the coastal bank, mentioned below. On the north-western end of Ta-ch'an there is a signal station, with which vessels can communicate by means of the International Code of Signals. On the north-eastern side of the islet there is a Customs station.

Hsiao-ch'an, 270 feet (82m3) high, lies on the same spit about 1½ miles

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Charts 3681, 3682.

northward of Ta-ch'an. A spit, with depths of less than 2 fathoms (3m7) over it, extends about 2 miles south-eastward from Hsiao-ch'an; Junk patch, with a depth of less than 6 feet (1m8) over it, lies near the end of this spit about 5½ cables east-north-eastward of the north-western extremity of Ta-ch'an. A rock, with a depth of less than 6 feet (1m8) over it, lies about a quarter of a mile north-eastward of Hsiao-ch'an.

Syah islet, 83 feet (25m3) high, lies about 7 cables westward of Hsiao-ch'an, and on the same spit as Hsiao-ch'an and Ta-ch'an.

Chart 3682.

Coast.—Between the northern entrance point of Ta-ch'an wan and Chuen pi point, the southern extremity of Chuen pi island and an almost isolated peak, about 14 miles north-westward, the coast is fringed by a drying mudbank, which extends from half a mile to 2 miles offshore, and the coastal bank, with depths of less than 3 fathoms (5m5) over it, extends as much as 3 miles farther offshore in places; its south-western edge is steep-to.

Kongsu bank, near the northern end of which is a patch which dries, lies on the outer edge of the coastal bank from about 2 to 6 miles north-westward of Syah islet. Fei hu bank, over which there is a least depth of 6 feet (1m8), lies on the outer edge of the coastal bank, from 1½ to 5 miles south-eastward of Chuen pi point.

Cha pin bay, which is very shallow, lies eastward of Chuen pi point; Hall creek, which separates Chuen pi island from the mainland, flows into the head of this bay.

Charts 3681, 3682.

Fan-shih shui-tao.—This channel is entered between Tzu chou and Fan-shih hsü (page 591), about 1¾ miles west-south-westward. The fairway into the entrance is narrow between the spit extending south-eastward from Tzu chou and the north-eastern side of the bank, with depths of less than 3 fathoms (5m5) over it, extending eastward from Fan-shih tui. The channel runs in a north-westerly direction between the banks extending from the mainland and the bank near the middle of the estuary, on the south-western side of which is Nei-ling-ting.

Between the vicinity of Tzu chou (*Lat. 22° 30′ N., Long. 113° 50′ E.*) and Syah islet there are numerous shoals in the channel, with depths varying from about 15 to 18 feet (4m6 to 5m5) over them, the positions of which can best be seen from the chart.

Tidal streams.—The rate of the tidal streams in Fan-shih shui-tao is from 3 to 4 knots at springs, increased during freshets. Southward of South Sand spit, the tidal streams are irregular, with undercurrents.

The ebb tidal stream eastward of Lintin island sets southward, but westward of the island it sets south-eastward.

North-western side of estuary.—Between the northern end of Chiao tao (page 588) and the southern end of Tai kok tau, an island, about 18 miles northward, the north-western portion of the Chu chiang estuary is occupied by shallow banks, extending in a general south-easterly direction, from the numerous islands which form its north-western side. Between these banks lie the entrances to the channels and creeks leading to the Hsi chiang and the city of Canton; Junk Fleet entrance, leading to Heng men (page 594) and Li-ch'i hung (page 621) and Lankit entrance, leading through Tai kok tau channel (page 631), to Canton, are the principal entrances.

Charts 3588, 3026, 2562, 2661a, 2661b.

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Chart 3681.

Junk Fleet entrance.—Lights.—The southern end of Junk Fleet entrance is situated close eastward of Chiao tao. In the entrance there is a bar, about three-quarters of a mile wide, with a least depth of 16 feet (4m9) over it; the northern end of this bar lies about 1½ miles south-eastward of the north-eastern extremity of Chiao tao. The channel of Junk Fleet entrance lies between the extensive shallow mudflats extending off the eastern side of Macao island, northward of Chinhsing men (page 588), and those extending south-south-eastward from Swashway bank, situated about 12 miles northward of Chiao tao.

A light is exhibited, at an elevation of 85 feet (25m9), from a white circular steel tower, 23 feet (7m0) in height, on the north-eastern extremity of Chiao tao.

The line of fishing stakes which lies off the north-eastern side of Chiao tao indicated on the chart, is reported to be always marked by lights at night.

On the western side of Junk Fleet entrance, Flat islet, 100 feet (30m5) high, lies on the eastern side of Inside bank, about 5 miles north-north-westward of the north-eastern extremity of Chiao tao. Inside bank dries 2 feet (0m6), and is separated from the coastal mud-bank, on which are several islets and rocks above water, by a shallow channel.

Mud islet is situated on Heng men chientan, on the western side of Junk Fleet entrance, and about 1½ miles northward of Flat islet.

On the eastern side of Junk Fleet entrance, Entrance patch, which dries, is situated about 4 miles northward of the north-eastern extremity of Chiao tao.

Charts 3681, 3682.

Heng men chientan, which dries 2 feet (0m6), is separated from the northern end of Inside bank by a narrow shallow channel.

Swashway spit, which dries, and the southern end of which is situated about 2 miles northward of Entrance patch (*Lat. 22° 30′ N., Long. 113° 39′ E.*), is the southern end of Swashway bank, which latter dries from 2 to 3 feet (0m6 to 0m9), and extends about 8 miles from the south-eastern end of one of the islands forming the north-western side of the Chu chiang estuary.

Chart 3682, plan of Wang mun entrance.

At its northern end, the channel of Junk Fleet entrance is about 3 cables wide between Heng men (Wang mun) entrance beacon, situated on the north-eastern side, about 4 miles northward of Mud islet, and the north-eastern end of Wang mun bank. Here the channel is divided, the western branch leading into Heng men and the north-western branches into Li-ch'i hung (page 594).

Heng men.—Lights.—The entrance to Heng men (Wang mun) is marked by High Cone, 915 feet (278m9) high, situated on the north-eastern end of Macao island, about 4 miles south-westward of Heng men entrance beacon, and by the summit of Cone island, 345 feet (105m2) high, about 1½ miles east-north-eastward of High Cone. Cone island lies on the north-western end of Heng men chientan; The Mound, 100 feet (30m5) high, on the north-eastern side of Cone island, is a useful mark. Ma-wei chou (Off islet), 180 feet (54m9) high, lies about half a mile eastward of the south-eastern extremity of Cone island, and Lan shan (Crag islet), 140 feet (42m7) high, with some rocks, one

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Chart 3682, plan of Wang mun entrance.

of which is one foot (0m3) high, close off its north-western side, lies about half a mile off the north-eastern side of Cone island.

The entrance to Heng men is obstructed by a bar, about three-quarters of a mile wide, over which a depth of 9 feet (2m7) can be carried.

A light is exhibited, at an elevation of 40 feet (12m2), from a mast over a white hut on a black pile structure, 44 feet (13m4) in height, known as Heng men entrance beacon, and situated on the south-western edge of Swashway bank.

Leading lights are exhibited from masts, surmounted by black spheres, situated on The Mound; these lights in line, bearing 232°, lead over Heng men bar.

A light is exhibited, at an elevation of 34 feet (10m4), from a mast surmounted by a black sphere, on a white hut on piles, known as Heng men (Wang mun) beacon, situated on the northern side of Heng men about 4 cables north-westward of The Mound.

Charts 3682, 3588.

On the southern side of Heng men there is a Custom house, situated on the eastern side of the mouth of a creek about 2¼ miles westward of the western extremity of Cone island; about 1¾ miles farther westward there is a conspicuous watch tower, a short distance inland. About one mile westward of the watch tower Heng men is joined from north-westward by Kerr channel (page 620) and Siulam channel (page 620) and from westward by a creek leading to Nemesis creek (page 618).

Charts 3681, 3682, with plan of Wang mun entrance.

Tidal streams.—In the entrance to Heng men a strong set northward is reported to be experienced during the last quarter of the ebb tidal stream.

Between Heng men entrance beacon and Heng men beacon, the tidal streams and currents are strong and caution is necessary.

Anchorage.—Directions.—Good anchorage can be obtained in Heng men off the mouth of the creek near the Custom house (*Lat. 22° 35′ N., Long. 113° 31′ E.*), in a depth of 21 feet (6m4).

Junk Fleet entrance should be approached with the north-eastern extremity of Flat islet in line with High Cone; bearing 317°, and the lighthouse on Chiao tao passed at a distance of about 5½ cables, whence course should be steered midway between the banks on either side. When the northern end of Ma-wei chou is in line with High Cone, bearing about 253°, course should be altered to pass Heng men entrance beacon at a distance of about 2½ cables. From this position, if proceeding to Li-ch'i hung (page 594), a mid-channel course should be steered until the stone barrier, on the north-eastern side of the channel at the outer end of the reclaimed land about 3½ miles northward of The Mound, is abeam, when the north-eastern side of the channel should be favoured. If proceeding into Heng men, a vessel should be kept in mid-channel until the light-beacons on The Mound are in line, bearing 232°, when they should be steered for on that bearing until just before the south-western extremity of Lan shan is open of the northern end of Ma-wei chou, bearing about 142°, when course may be shaped to pass into Heng men.

Charts 3681, 3682.

Lankit entrance.—Light.—On the western side of the approach to Lankit entrance, a bank, with depths of less than 3 fathoms (5m5)

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Charts 3681, 3682.

over it, extends eastward from Entrance patch and Swashway spit almost as far as Ling-ting Shuan-chou (page 591). False spit, which dries, extends from the south-eastern side of Swashway bank. The southern end of Fraser bank, on which are some patches which dry one foot (0m3), lies midway between False spit and the northern end of Ling-ting Shuan-chou.

Chart 1741.

Fraser bank is an extension south-eastward of a detached mud bank which dries 2 feet (0m6); the north-western end of this mud bank lies about one mile southward of Tai kok tau island. There is a channel, about 4 cables wide, between the south-western side of this mud bank and Swashway bank, but it is obstructed by a bar at its south-eastern end; the north-eastern side of this mud bank and Fraser bank form the south-western side of Lankit entrance.

The north-eastern side of Lankit entrance is formed by a bank, with depths of less than 2 fathoms (3m7) over it, which extends about 6 miles from the south-eastern end of Tai kok tau island, terminating in Lankit spit.

Lung-hsueh (Lankit), an island, 220 feet (67m1) high near its south-western end, lies on the last-mentioned bank, about 4 miles south-south-eastward of Bower point, the south-eastern extremity of Tai kok tau island. There is a small temple close to some trees on the south-western end of Lung-hsueh; this part of the island is covered with earthen vessels containing human bones. Lankit bank, which dries, extends about half a mile south-eastward from the island, and Lankit hump, with a depth of less than one fathom (1m8) over it, extends about 1¼ miles farther south-eastward; Lankit spit is a continuation of Lankit hump. A bank, which dries 2 feet (0m6), extends about 1½ miles north-north-westward from Lung-hsueh; Lankit rock, 70 feet (21m3) high, lies on the north-eastern side of this bank, about a quarter of a mile north-eastward of the northern extremity of Lung-hsueh.

A bank, which dries one foot (0m3), extends about 1¼ miles from the south-eastern end of Tai kok tau island. Chen-hsiang (East Au chau) lies on this bank, about three-quarters of a mile southward of Bower point, and about 3 cables east-south-eastward of West Au chau, situated on the coast.

Shan-pan chou (Sampan chau), consisting of two islets about a quarter of a mile apart connected by a drying bank, lies about one mile north-north-eastward of Lankit rock (*Lat. 22° 42′ N., Long. 113° 39′ E.*). The north-western islet is low, and the south-eastern has a rounded summit, 44 feet (13m4) high, resembling an overturned boat. A reef, which dries, lies about 1¼ cables northward of the south-eastern islet, and detached reefs extend about 2 cables north-westward from the north-western islet. A rock, which dries 2 feet (0m6), lies about 3½ cables southward of the south-eastern islet, with a drying sandbank between it and the reefs extending from the north-western islet.

A light is exhibited, at an elevation of 95 feet (29m0), on the summit of Shan-pan chou.

Chart 3682.

At its north-western end, Lankit entrance leads into Tai kok tau channel (page 631) through Chiu mun, between Black point, situated on the south-western end of Tai kok tau island, about 3 miles west-

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Chart 3682.

south-westward of Bower point, and the north-eastern side of an island, about 6 cables south-westward.

Lankit entrance appears to be particularly susceptible to periodical shifting of sandbanks. In 1935, it was reported that a channel existed between Shan-pan chou and Black point, and that the western entrance was then almost closed.

Charts 3681, 3682.

Fishing stakes.—There are usually some fishing stakes with boats made fast to them between Nei-ling-ting and Lankit, and in various other places in this locality; care should be taken not to run down the boats which generally exhibit lights at night.

Anchorage.—Vessels can lie securely in the Chu chiang estuary, northward of Ling-ting Shuan chou, during a typhoon.

Charts 1180, 3681, 3682.

General directions.—Tidal streams.—There should be no difficulty in entering the Chu chiang estuary during daylight. Vessels should not proceed northward of Nei-ling-ting without local knowledge. Care should be taken to avoid the fishing stakes.

If making the land in thick weather, it may be noted that Chiapeng chuntao and Lima chuntao, excepting Tankan shan, which is long and undulating, are detached, high, and uneven, with depths of 20 fathoms (36m6) fairly close to, whereas the islands between Tawan shan and Chang-ch'uan shan (chart 2212), 50 miles west-south-westward, are large and of regular appearance, resembling a coast more than islands, with depths of only 10 and 11 fathoms (18m3 and 20m1) at a considerable distance southward of them. *See* views facing page 456.

Tahsi shuitao is generally used by vessels of suitable draught when bound for the Chu chiang estuary during the strength of the South-west monsoon, or from about June to August inclusive. A berth should be given to the islands southward of Macao as the depths are reported to be less than charted in that neighbourhood.

In bad weather Macao roadstead should not be used and vessels should proceed to Urmston road, or, if with local knowledge, well above Nei-ling-ting (*Lat. 22° 25′ N., Long. 113° 48′ E.*), where typhoons are less violent than amongst the islands in the approaches.

The freshets out of the Chu chiang, through Tahsi shuitao, set almost constantly from the southern end of Ta-heng-ch'in along the islands westward, at the rate of from one to 2 knots, particularly with strong easterly winds, and although at times, especially during the South-west monsoon period, there seems to be a surface stream setting eastward or into the entrance of the estuary, the freshets underneath continue to run westward. The freshets abate at times and then weak tidal streams set eastward, but these are not of long duration.

Between Macao roadstead and Nei-ling-ting, the tidal streams frequently set in a different direction at the surface from that underneath. The ebb tidal stream is stronger and continues longer than the flood; the freshets often run out below the surface when the flood tidal stream is running at the surface.

Vessels approaching from eastward and south-eastward can proceed through Lema or Tai ta mi channels, and pass either northward of Wailingting to Lantao channel, or through any of the channels between the islands that are fairly wide and clear.

The streams amongst the islands lying south-eastward of the estuary

Charts 3588, 3026, 2562, 2661a, 2661b.

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Charts 1180, 3681, 3682.

set in varying directions, according to the prevailing winds; a strong easterly wind generally produces a westerly current which the ebb tidal stream reduces in strength.

When clear of Lantao channel, or about 2 miles off the western end of Lantao, if bound for the Chu chiang, a vessel should steer to pass about one mile westward of Nei-ling-ting.

If bound for Urmston road, from a position about 2 miles north-westward of Peaked hill (*Lat. 22° 13′ N., Long. 113° 50′ E.*), Castle peak should be steered for bearing 041°, passing about midway between the bank extending southward from Sha chau and Chu lu kok bank, in a depth of not less than 18 feet (5^{m}5). When Red point, the north-eastern extremity of Chu lu kok, bears 146°, course may be altered north-westward, with Red point astern on that bearing, anchoring as desired. During the South-west monsoon, vessels can proceed eastward, where more sheltered anchorage can be obtained northward of The Brothers.

The tidal streams must be considered; and a good look-out kept for fishing stakes.

Vessels bound to Canton from Urmston road can make use of Fan-shih shui tao, directions for which are given on page 616.

Chart 3588.

CHU CHIANG.—Depths.—Pilots.—For pilots, *see* page 574.

Second bar (page 602), about 20 miles below Canton, had, in 1946, a least depth of 12 feet (3^{m}7) over it. First bar (page 604) is situated about 7 miles above Second bar, and had, in 1946, a least depth of 18 feet (5^{m}5). The least depth thence to Canton through Blenheim and Elliot passages, in 1949, was only 4 feet (1^{m}2) through Li-chiao barrier (page 611).

The passage between Huang-pu (Whampoa) and Canton by Whampoa channel is only used by small Chinese vessels and by Chinese Naval vessels, which anchor eastward of the Hai-chu bridge.

Considerable shoaling was reported, in 1934, to have taken place in certain areas, particularly in the upper reaches where the depths are generally less than charted.

In the North-east monsoon, about one foot (0^{m}3) greater depth will be obtained on the night tide than on the day tide, and in the South-west monsoon, the reverse.

In the South-west monsoon the level of the river is apparently one foot (0^{m}3) higher than in the North-east monsoon.

The wind has a great effect on the depths. A fresh south-easterly wind increases the depth by 2 feet (0^{m}6), and, it is reported, that a strong north-westerly wind decreases the depth by a proportionate amount.

Tide-gauges, showing the level of the water above lowest low water springs, are established off Blake point, at Belcher reach tide-pole lighthouse, Huang-pu Custom house, at a jetty on the bank eastward of Macao fort, and the British Consulate jetty, Canton; the latter is not visible to shipping in the channel.

Chart 1741.

Chuen pi point to Blenheim point. — Dangers. — Light. — The Chu chiang, or Canton river, is entered at the northern end of the estuary by Chuen pi channel, which lies between the south-western

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Chart 1741.

end of Chuen pi island and Bower point (page 596). In the approach to the entrance, the channel is about one mile wide between the reef lying 1¼ cables northward of Shan-pan chou lighthouse and the south-western edge of the bank, with depths of less than 3 fathoms (5m5) over it, extending south-eastward from Chuen pi point (page 593). A short distance within the entrance the river is divided by the Wantong islands into two channels, Boca Tigris and Bremer channel; the former, which is generally used, is the north-eastern.

There is a small sandy bay on each side of Chuen pi point (*Lat. 22° 45′ N., Long. 113° 40′ E.*); there is anchorage about 3 cables south-westward of this point, in a depth of about 6 fathoms (11m0).

A concrete pier, with a T-head, about 65 feet (19m8) long, which dries alongside, is situated at Chuen pi point.

Tower hill, on which is a signal station, lies about one mile north-north-westward of Chuen pi point, with Chuen pi fort on the coast, about three-quarters of a cable west-north-westward of it.

Pratt rock, 3 feet (0m9) high, and fairly steep-to on its western side, lies about 6 cables north-westward of Chuen pi point and 1½ cables offshore.

Junk creek, which is shallow, is entered between Chuen pi fort and Kwan point, the southern extremity of Anunghoy (Anung hoi) island, about 1½ miles northward. Pritchard rock and Mu-mien-kang (Junk island) lie within the entrance, about 1½ and 3½ cables, respectively, south-eastward of Kwan point. A bank, which dries, extends 5½ cables south-south-westward from Kwan point, and a bank, which dries 2 feet (0m6), extends about one mile south-south-westward from Pritchard rock. The city of Hu-men-chai (Taiping) is situated on the north-eastern side of Junk creek, about 2¼ miles north-north-eastward of Kwan point.

Boca Tigris lies between the south-western side of Anunghoy island and the Wantong islands.

Anunghoy point, on which is a fort with a flagstaff, lies about 2 miles west-north-westward of Kwan point. A reef, which is steep-to, extends a short distance from Anunghoy point. Keshen point lies about half a mile north-westward of Anunghoy point, with Anunghoy peak, 575 feet (175m3) high, about 3½ cables eastward.

North and South Wantong are two islands about 4 cables apart in a north-north-westerly direction, lying on a bank which separates Boca Tigris from Bremer channel. North Wantong is situated about 7 cables westward of Anunghoy point. A bank, with depths of less than 3 fathoms (5m5) over it, extends about 1¼ cables north-westward from North Wantong and nearly 1¾ miles south-eastward from South Wantong.

Chain rock, above water, lies about 2 cables east-south-eastward of North Wantong, and is foul for a short distance off its north-eastern side.

A light is exhibited, at an elevation of 33 feet (10m1), from a red square brick tower, 36 feet (11m0) in height, on Chain rock.

On the south-western side of the river, there are depths of about 4 fathoms (7m3), in the approach to Bremer channel, over the ridge which connects the shoal, on which the Wantong islands lie, with Tai kok tau island, a short distance southward of Bower point.

Between Scott point, about 7 cables north-north-westward of Bower

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Chart 1741.

point, and Blenheim point, 3 miles farther north-north-westward, there is a bight, from the northern portion of which a bank, with depths of less than 6 fathoms (11m0) over it, extends as much as 9 cables; Adventure bank, over which there is a least depth of 1½ fathoms (2m7), lies with its shoalest part near the outer edge of this bank about 1¼ miles south-eastward of Blenheim point.

Bremer channel is only used by junks.

Charts 1741, 1740.

Duff rock, a pinnacle with a depth of 3 fathoms (5m5) over it, lies about 8 cables eastward of Blenheim point. The rock is situated on the south-western side of a bank, with depths of less than 6 fathoms (11m0) over it, which extends about 3 cables north-westward and 7½ cables south-eastward from the rock, and lies near the fairway of the main channel.

A pinnacle rock, with a least depth of 17 feet (5m2) over it, lies about 1½ cables south-eastward of Duff rock; two pinnacle rocks, each with a least depth of 18 feet (5m5) over it, lie about three-quarters of a cable apart, about half a mile south-eastward of Duff rock (*Lat. 22° 49′ N., Long. 113° 36′ E.*).

Chart 1741.

Anchorage.—Directions.—It is only necessary for vessels to keep in the fairway when passing through Boca Tigris; they generally keep near the north-eastern shore, the tidal streams running strongly in eddies.

Temporary anchorage can be obtained about a quarter of a mile northward of North Wantong, in depths of from 6½ to 7 fathoms (11m9 to 12m8).

Chart 1740.

Blenheim point to Malcolm point. — Lights. — Dangers. — On the eastern side of the river, above Boca Tigris, Anunghoy creek, which is available for small junks, is entered between Fleming point, the southern extremity of Senhouse island, situated about 1¼ miles northward of Anunghoy point, and a point on the north-western side of Anunghoy island, about 2½ cables southward.

Ta-hu shan (Tiger island), 572 feet (174m3) high, lies on the south-western side of the main channel, with Tigers Claw, its south-eastern extremity, about half a mile north-north-eastward of Blenheim point. The northern end of Ta-hu shan consists of a remarkable mass of rounded granite with precipitous sides. A spit, with depths of less than 3 fathoms (5m5) over it, extends nearly 2 cables south-eastward from the island, and a similar bank extends about one cable from its northern end.

Bate rock, with a depth of 14 feet (4m3) over it, and steep-to, with 10 fathoms (18m3), mud, close eastward, lies about 2 cables north-eastward of the northern extremity of Ta-hu shan. The western extremity of North Wantong (chart 1741), bearing 149°, or the whole island open north-eastward of Ta-hu shan leads north-eastward of Bate rock.

Above Ta-hu shan the river banks become more clearly defined, and assume the character of alluvial flats for many miles.

Tauling island or Saitaitan, which is covered with trees, lies on the eastern side of the fairway, with its southern extremity about 1¼ miles north-eastward of Ta-hu shan. Tauling flat, with a depth of 11 feet

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Chart 1740.

(3m4) over its south-western side, extends about 2 miles southward from the southern end of the island, leaving a deep channel, about 3 cables wide, between it and Ta-hu shan. A bank, with depths of less than 6 fathoms (11m0) over it, extends about one mile south-westward from the southern end of Tauling island, leaving a deep channel, 3 cables wide between its south-western edge and Bate rock.

Chuen pi fort (chart 1741), bearing about 134°, and open south-westward of Anunghoy point, leads south-westward of Tauling flat.

The tidal streams are strong between Ta-hu shan and Tauling flat.

Tauling East passage lies between Tauling island and Tauling flat, on its western side, and Tainai chau, consisting of Senhouse island, with Maitland island close northward, and Dundas island, close north-westward of Maitland island, on its eastern side. The passage is shallow and is obstructed by fishing stakes at its southern end.

Sawshi channel (page 639) is entered between the northern extremity of Tauling island and Blake point, the southern extremity of Naichow, about 1½ miles northward.

A light is exhibited, at an elevation of 40 feet (12m2), from a white mast and hut, about 2½ cables northward of Blake point.

A tide-gauge, which is illuminated at night, is established in front of Blake point light (*Lat. 22° 54′ N., Long. 113° 34′ E.*).

A groyne projects from the eastern bank close southward of the light-structure on Blake point.

On the western side of the river, Gutzlaff channel (page 631), leading to Saiwan channel (page 632) and Hill passage (page 632), is entered between Blenheim point and the eastern end of Gifu island, about 2 miles north-westward; Ta-hu shan lies in the approach to this channel. Gifu rock, which dries, lies nearly one cable off the eastern side of Gifu island. Shatsai, or Whitcomb island, lies northward of Gifu island, separated by a narrow shallow channel. Hill passage is entered from south-eastward between Bedingfield point, the south-eastern extremity of Ta sha (Stransham), an island, situated 4 miles north-north-westward of Blenheim point, and a point on the north-eastern side of Shatsai, about 4 cables south-westward.

In 1928, the depths between Ta sha and Shatsai were reported to be less than indicated on the chart.

Kongausha, or Elliot island, on the southern end of which is a grassy tongue, lies eastward of Ta sha, separated from it by a narrow, shallow channel, and Hai hsin sha (Hoisamsha or Bolton island) lies northward and north-westward of Ta sha, separated by a similar channel.

On the eastern side of the river, Amherst point is situated on the western side of Parker island or Lapsha, about 3¼ miles north-north-westward of Blake point. Law point, the north-western extremity of Parker island, lies about one mile northward of Amherst point.

A light is exhibited, at an elevation of 40 feet (12m2), from a white mast and hut, on Amherst point.

The southern end of Small bar, a bank, lying in mid-channel and over which there are depths of less than 3 fathoms (5m5), is situated about half a mile eastward of Bedingfield point.

Calcutta shoal, situated near the northern end of Small bar, has two heads, with a depth of 5 feet (1m5) over them, about 1¾ cables apart, the northern of which lies about 7 cables west-south-westward of Blake point.

Charts 3588, 2562, 2661a, 2661b.

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Chart 1740.

A 3-fathom (5m5) patch lies northward of Small bar, nearly in mid-channel, 9 cables north-westward of Blake point and half a mile off the western shore.

On the western side of the river, northward of Small bar, as far as Maxwell point, the northern extremity of Ta sha, a bank, with depths of less than 3 fathoms (5m5) over it, extends from 3½ to 6½ cables offshore; in a position about 2½ miles south-eastward of Maxwell point there is a patch, with a least depth of one foot (0m3) on this bank, about 3 cables offshore.

On the eastern side of the river, a detached shoal, with depths of less than 3 fathoms (5m5) over it, lies about one mile southward of Amherst point, parallel with the shore and about 2 cables off it. The shore bank, with depths of less than 3 fathoms (5m5) over it, extends about 2½ cables offshore at Amherst point.

Two shoals, with depths of 13 and 15 feet (4m0 and 4m6) over them, lie about 6½ and 9 cables, respectively, west-north-westward of Amherst point light-structure (*Lat. 22° 57′ N., Long. 113° 33′ E.*), and about 3½ cables farther west-north-westward there was, in 1946, a least depth of 12 feet (3m7).

Second bar creek (page 640) is entered between Law point and Malcolm point, the southern extremity of Pottinger island, about 3 cables northward.

Charts 1740, 1742.

Second bar.—Light-buoys.—Second bar, with depths of less than 3 fathoms (5m5) over it, extends almost completely across the river from the south-western end of Pottinger island.

The shallowest part of the bar consists of a ridge, with depths of less than 2 fathoms (3m7) over it, and a least depth of 9 feet (2m7), which extends parallel with the eastern bank from a position, about half a mile west-south-westward of Malcolm point, for a distance of 1¾ miles; the northern end of this ridge is called Second Bar bank.

Two black conical light-buoys, both unlit, are moored about one mile west-south-westward, and 1½ miles westward, respectively, of Malcolm point; these buoys should be left close to starboard when proceeding up river.

Midway between Second Bar bank and Moth point, the northern extremity of Hai hsin sha, is the southern end of a bank, with depths of less than 3 fathoms (5m5) over it, which extends about 4½ miles north-north-westward. Parts of the southern end of this bank dry 2 feet (0m6), and there is a narrow ridge, with depths of less than one fathom (1m8) over it, running down its centre, the extent of which can best be seen on the chart.

Vessels should not cross Second bar without local knowledge.

The northern entrance of Hill passage (page 601) lies between Moth point and a point about one mile northward.

Second bar pagoda with Lin fo fort close northward, both of which are conspicuous, stands on a hill about 1¼ miles north-westward of Moth point.

Chart 1742.

Second bar to Belcher reach.—Beacon.—Buoy.—Light.—The mouth of Nimrod creek is situated on the western side of the river, between Barlow and Meek points, about 2½ miles north-north-westward of Moth point.

Charts 3588, 2562, 2661a, 2661b.

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Chart 1742.

A tower stands on the southern extremity of Meek point, and a black conical buoy is moored about 3 cables east-south-eastward of the tower, on the eastern side of the entrance to Nimrod creek. Fishing stakes extend about one cable offshore from a position about 8 cables southward of Barlow point.

The mouth of Tseki creek is situated on the eastern side of the river between Wusnam point, the north-western extremity of Pottinger island, and Knowles point, the south-western extremity of Artillery island, about one mile north-eastward of the mouth of Nimrod creek.

Escape creek, the principal entrance to the Tung chiang (page 641), is entered between a point, marked by a beacon, on Artillery island, about 3 cables northward of Knowles point, and the southern extremity of Davis island, about a quarter of a mile north-westward; a drying bank, on which there is an artificial embankment, extends 2 cables southward from the north-western entrance point and an islet lies about one cable westward of the same point. Between the south-eastern entrance point of Escape creek and a point on Pottinger island, about 1½ miles south-south-eastward, a bank, with depths of less than 3 fathoms (5m5) over it, extends about a quarter of a mile offshore.

Pratt point (*Lat. 23° 04′ N., Long. 113° 30′ E.*) lies on the south-western side of Davis island about 1½ miles north-westward of its southern extremity.

Belcher reach lies between the south-western side of Davis island and the south-western side of the river.

A light is exhibited, at an elevation of 40 feet (12m2), from a white mast and hut, situated on the south-western bank of the river at the southern end of Belcher reach, about one mile southward of Pratt point.

There is a tide-gauge near the lighthouse.

Chart 3588.

CANTON APPROACH.—Above Belcher reach, the Chu chiang is divided by Danes island and Ta-chi sha (Flat islands), four in number, eastward of it, into two main branches, Huang-pu channel, described below, and Blenheim passage (page 608); these meet again at Choutou tsui, abreast the city of Canton.

By the southern, or Blenheim passage, the distance to Choutou tsui from the junction is about 16 miles, and by the northern, or Whampoa channel, about 13 miles. Owing to the construction of the Chu chiang bridge, about 1½ miles below Choutou tsui, foreign vessels do not now proceed above Huang-pu (Whampoa) by the latter channel.

Chart 1742.

Huang-pu channel. — Lower portion. — Dangers. — Buoy. — Light.—At its north-western end, Belcher reach leads into Blenheim reach. Huang-pu channel is entered between the south-eastern extremity of Flat island, No. 1, the easternmost of those islands, situated about 2 miles north-westward of Pratt point, and the north-western extremity of T'ung-ku sha, about 3 cables north-eastward.

T'ung-ku sha (First bar island), which is low and flat, is separated from the north-eastern bank of the river by a shallow channel, about 2 cables wide; the entrance to Junk passage, which connects this part of the river with Escape creek (page 641), is situated on the eastern side of this channel, about 4 cables north-eastward of the

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Chart 1742.

southern extremity of T'ung-ku sha. A bank, with a depth of 11 feet (3^{m}4) near its south-western edge, extends about 1¾ cables from the south-western side of T'ung-ku sha. The northern end of T'ung-ku sha is connected to the northern bank of the river by a bank, with depths of less than 3 fathoms (5^{m}5) over it, and which extends to the mainland shore north-westward of the island.

A spit, with depths of less than 3 fathoms (5^{m}5) over it, extends about 4 cables east-south-eastward from Flat island, No. 1; a red conical buoy is moored on this spit about 2½ cables east-south-eastward of the south-eastern extremity of the island. A bank, with depths of less than 3 fathoms (5^{m}5) over it, extends about 2 cables from the north-eastern side of the same island.

A light is exhibited, at an elevation of 40 feet (12^{m}2), from a white mast and hut, on the south-western side of T'ung-ku sha, about half a cable from its north-western extremity.

First bar, in the narrow fairway of which, in 1946, there was a least depth of 18 feet (5^{m}5), lies between the bank extending from the north-eastern side of Flat island No. 1, and the bank extending from the north-western end of T'ung-ku sha.

Brunswick patches (*Lat. 23° 05′ N., Long. 113° 28′ E.*), with a least depth of 15 feet (4^{m}6) over them, lie in mid-channel, about 7 cables north-westward of T'ung-ku sha.

Cambridge reach.—Cambridge reach, above Brunswick patches, leads to Huang-pu. On the southern side of the reach, the channels between Ta-chi sha are narrow and shallow. Chop boat creek, between Flat island No. 4, the westernmost of those islands, and Danes island, lying south-westward of it, is also shallow and less than one cable wide; it can be used if there is 6 feet (1^{m}8) on the tide-gauge at Huang-pu.

Cambridge bank, part of which dries 4 feet (1^{m}2), extends about 2½ cables northward from Ta-chi sha. The northern side of Cambridge reach is clear of danger.

Louisa island lies close off the northern bank of Cambridge reach northward of Flat island No. 4.

The port of Huang-pu or Whampoa extends as far eastward as a quarter of a mile eastward of Louisa island; it was officially opened for shipping in November, 1948. About that date it was reported that there existed quayage, about 1,000 feet (304^{m}8) in length, with a depth of 24 feet (7^{m}3) alongside, suitable for large vessels, but that dredging was still necessary both inside and outside the port limits; further constructional work was then in progress. The port is equipped with a 30-ton floating crane, and is linked with Canton by the Canton-Kowloon railway.

A small **T**-headed pier extends from the south-eastern part of Louisa island, and is connected by a bridge with the mainland.

A wharf, 1,300 feet (396^{m}2) long, is situated on the northern bank of Cambridge reach close eastward of Louisa island.

Submarine cable.—Beacons.—A submarine telegraph cable, indicated on the chart, crosses the river from a point about one cable westward of Louisa island to the north-eastern side of Danes island. Its direction is marked by two pole beacons on each bank, those nearest the river bank having boards with the words "Telegraph cable" on them. Vessels should not anchor here.

Charts 3588, 2562, 2661a, 2661b.

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Chart 3646.

From the western end of Cambridge reach, Huang pu channel trends in a north-westerly direction.

Huang-pu town and harbour.—Light.—The town of Huang-pu or Whampoa is situated on the northern and north-western sides of Danes island, and on the south-eastern side of English reach, a branch of the river which leads south-westward from the western end of Cambridge reach, through American reach, into Elliot passage (page 611).

The Government wharf is 1,312 feet (399m2) long, with a depth of 30 feet (9m1) alongside.

Huang-pu harbour, fronting the town, has numerous landing stages but, in 1948, these were in a bad state of repair and, westward of them, the harbour front had silted up.

The western part of Danes island (*Lat. 23° 05′ N., Long. 113° 25′ E.*) is hilly, and a flagstaff stands on Signal hill, 248 feet (75m6) high, about a quarter of a mile inland, southward of the town.

Hung fuk shi, a village built on piles, and in which there is a jetty, is situated at the eastern end of Huang-pu. Farther westward are the Chinese military and naval establishments. About 3½ cables north-eastward of Jardine point, the western extremity of Danes island, there is a jetty, close eastward of which there is a graving dock, known as Cooper's dock, which, in 1948, had silted up.

Sulphur point, the eastern extremity of Huang-pu tao, lies on the north-western side of English reach, about 4½ cables north-eastward of Jardine point. The town of San chau extends west-south-westward from Sulphur point along the northern bank of American reach.

A large T-headed pier is situated about 3½ cables west-south-westward of Sulphur point.

The south-eastern ends of Pedder, Pei sha or Junk island and Watson island lie north-eastward of Sulphur point and are fringed by drying shoals; a bank, with depths of less than 3 fathoms (5m5) over it, stretches east-north-eastward from Sulphur point across the river. The extent of this bank and the positions of the islands can best be seen on the chart.

A light is exhibited, at an elevation of 15 feet (4m6), from a red pile beacon, surmounted by a disc, situated about a quarter of a mile east-north-eastward of Sulphur point.

There is a tide-gauge at the Custom house in Huang-pu, about 3½ cables east-south-eastward of this light-beacon.

Charts 3646, 1742.

Anchorages.—The anchorage, the north-western and western limits of which are indicated by pecked lines on the chart, is in English and American reaches, in depths of from 4½ to 7 fathoms (8m2 to 12m8), soft mud; it is safe, with a moderate tidal stream; there is not, however, room for two large vessels to moor abreast.

There are some mooring buoys in English reach.

The anchorage for foreign vessels is between the eastern end of Cambridge reach and Gully point, situated on the southern side of the western limit of the anchorage.

The anchorage for vessels with explosives, high inflammables, or mineral oil on board, is between the eastern end of Cambridge reach and the north-western extremity of Flat island No. 4.

Vessels anchoring in the above-mentioned anchorages will be moored under the direction of the Berthing master.

Charts 3588, 2562, 2661a, 2661b.

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Charts 3646, 1742.

The quarantine anchorage is in Belcher reach, below T'ung-ku sha.

Regulations.—*See* page **614**.

Storm and other signals.—Storm signals, similar to those displayed at Hong Kong (page **497**), are shown at the signal station at Huang-pu.

For other signals, *see* page **24**.

Chart 3646.

French river.—French river lies between Danes island and French island, and is entered from north-westward between Jardine point and Gully point (*Lat. 23° 05′ N., Long. 113° 24′ E.*), the northern extremity of the latter island. At its south-eastern end, French river is divided into two channels by Powder island, lying between Rippon point, the southern extremity of Danes island, and Calliope point, the north-eastern extremity of French island, about 3½ cables south-westward. French river connects American reach with Collinson reach (page **608**) and is frequented by steam launches, which use the channel between Powder island and French island, in which there is a depth of 4 feet (1^{m}2).

The river can be used if there is 6 feet (1^{m}8) on the tide-gauge at Huang-pu.

Upper portion of Huang-pu channel.—Dangers.—Beacon.—The entrance to the upper portion of Huang-pu channel lies between Sulphur point and a point on the northern bank of the river about one mile east-north-eastward. The islands lying in the entrance and the shoal stretching across it, are mentioned on page **605**. There are channels, in which the depths are irregular, between these islands. A spit, on the extremity of which is a rock which dries 6 feet (1^{m}8), extends about 2½ cables from the western end of Watson island.

Junk creek is the channel which separates Pei sha from Huang-pu tao. A rock, which dries one foot (0^{m}3) and is marked by a black and white spar beacon, lies in Junk creek, about one cable eastward of the north-western extremity of Pedder island and less than half a cable off the south-western side of Pei sha. A shoal, which dries 4 feet (1^{m}2), lies close off Huang-pu tao abreast Pedder island.

Both Pedder island and Green island, 3 cables west-north-westward, are cultivated; Green island has small trees on it and is more conspicuous than Pedder island, which covers at high water. A pinnacle rock, with a depth of 8 feet (2^{m}4) over it, lies in the channel midway between the south-eastern end of Green island and the south-western side of Pei sha.

East pagoda, 117 feet (35^{m}7) high, is situated on Huang-pu tao, about 6 cables north-westward of Sulphur point. Pa-chou Large pagoda, 258 feet (78^{m}6) high, with Pa-chou Small pagoda, 75 feet (22^{m}9) high, on the coast, about half a mile north-eastward, stands about 1½ miles west-north-westward of East pagoda. The town of Pa-chou stands between the large and small pagodas. Inclined pagoda (chart 3647), 205 feet (62^{m}5) high, stands about 3 miles farther westward and 3½ cables inland.

Symons island lies close to the northern bank, northward of Pa-chou.

Pa-chou kok rock, with a least depth of 8 feet (2^{m}4) over it, lies about 2 cables east-north-eastward of Pa-chou Small pagoda and less than one cable offshore.

Hankow rock, with a depth of 9 feet (2^{m}7) over it, lies about 2 cables north-westward of Pa-chou Small pagoda and about one cable off the

Charts 1739, 3588, 2562, 2661a, 2661b.

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Chart 3646.

southern side of the channel. A shoal, with a depth of 5 feet (1m5) over it, lies nearly in mid-channel a short distance north-westward of Hankow rock. There are usually indications of this shoal, which, at low water, are very marked.

Powan rock, with a depth of 8 feet (2m4) over it, lies about 6½ cables north-westward of Pa-chou Large pagoda and one cable off the northern bank of the channel.

Chart 3647.

A rock, with a depth of 5 feet (1m5) over it, lies nearly in mid-channel, about 1¾ miles east-north-eastward of Inclined pagoda (*Lat. 23° 06′ N., Long. 113° 19′ E.*). There is a rock, with a depth of 7 feet (2m1) over it, in mid-channel, about 3 cables west-north-westward of the last-mentioned rock.

Huang-pu barrier.—Light-beacons.—Huang-pu or Whampoa barrier, consisting of wooden piles and sunken junks, extends almost completely across the river close eastward of Hai-san-sha, or New island, situated on the northern side of the channel, about 5½ cables northward of Inclined pagoda. The northern end of the barrier is marked by a beacon. Southward of the barrier, there is a channel, 400 feet (121m9) wide, in the fairway of the eastern approach to which there is a least depth of 9 feet (2m7). A shoal, with a depth of 3 feet (0m9) over its south-western side, lies about one cable eastward of the southern end of the barrier.

The passage is marked on its northern side by two red dolphin beacons, one on the southern end of the barrier, and the other at the southern end of the shoal eastward of it. The southern side of the passage is marked by a black dolphin beacon. Lights are exhibited from these beacons.

Chart 1742.

Fiddlers reach, connecting this part of Huang-pu channel with American reach (page 605), lies between Huang-pu tao and Ho-nan tao, its northern entrance being southward of Huang-pu barrier, and its eastern entrance, close northward of Hall point, the eastern extremity of Ho-nan tao.

Chart 3647.

Huang-pu barrier to Canton harbour.—Westward of Huang-pu barrier, Erh-sha or Napier island lies westward of Hai-san-sha, and Ta-sha-tou, or Kuper island, lies north-westward of the latter. This part of the channel is known as Ta yung k'ou (Front reach). The channel northward of the last-mentioned island is shallow. Salt flats, with depths of from 5 to 7 feet (1m5 to 2m1) over them, extend across Ta yung k'ou from the western end of Erh-sha to Ho-nan tao. A rock, with a depth of less than 6 feet (1m8) over it, lies in the fairway, about 2 cables south-westward of the western extremity of Erh-sha.

The eastern end of Canton harbour (page 611), the limit of which is indicated by a pecked line on the chart, is between a point about one cable south-eastward of the western extremity of Ta-sha-tou and the western entrance point of Shek chung creek, about 3 cables south-south-westward; a reef, with depths of from one to 5 feet (0m3 to 1m5) over it, extends three-quarters of a cable from the southern bank, close eastward of the mouth of this creek.

Chart 3646.

Directions.—Vessels should not proceed above Huang-pu by

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Chart 3646.

Huang-pu channel, using Junk creek, without recent local knowledge as the depths are liable to change.

Chart 3647.

Caution is required when passing Huang-pu barrier if the tidal stream is strong, in which case a vessel should hug the southern bank at the entrance to Fiddlers reach.

To pass Salt flats in a depth of 11 feet (3m4), the tide-gauge at Huang-pu Custom house must show 12½ feet (3m8), and it must be within one hour of high water. A vessel should be in mid-river when passing the reef extending from the mouth of Shek chung creek, after having passed northward of the rock, with a depth of less than 6 feet (1m8) over it, lying in the fairway nearly midway between that reef and the western end of Erh-sha (*Lat. 23° 07′ N., Long. 113° 18′ E.*).

Chart 3588.

The route used in 1949 for vessels proceeding to Canton was through Blenheim, Collinson, Kellett and Brown reaches, passing southward of Danes and French islands; thence through Elliot passage and Nanho tao. For navigable depths, *see* page 598.

Chart 1742.

Blenheim passage.—Blenheim passage is entered by Blenheim reach between the south-eastern extremity of Flat island No. 1, and the south-western side of the river. A shoal, on which are patches, with depths of less than one fathom (1m8) over them, extends about 4 cables from the southern side of Blenheim reach. Considerable changes were reported in 1924, to have taken place in Blenheim reach, and the chart should be used with caution.

Collinson barrier.—Buoyage.—Piles.—This barrier, consisting of the remains of a pile barrier, separates Blenheim and Collinson reaches, and extends from Flat island No. 3, southward across the river. There is an opening in its northern part, 470 feet (143m3) wide, in which there is a least depth of 18 feet (5m5). The northern side of the opening is marked by a red conical buoy, and the southern side by a black conical buoy.

Two piles are situated northward of the opening, one on the southern shore of Flat island No. 3, and the other about midway between it and the charted position of the red conical buoy. A pile also marks the south-western extremity of Flat island No. 2, and another stands on the southern shore of Flat island No. 3, about 2¼ cables north-westward of the opening.

Chart 3646.

Collinson barrier to Chang shan. — Lights. — Dangers. — Light-buoy.—Beacon.—Sin Nanzing rock, with a depth of 9 feet (2m7) over it, lies in Collinson reach, about 3¼ cables eastward of Rippon point (page 606). The eddies round this rock can always be seen, and should be avoided.

The south-eastern entrance of French river (page 606) is situated between Rippon point and Calliope point. A drying bank extends a short distance north-eastward from the latter point; fishing stakes, extending into mid-channel, are established off this bank every winter.

Collinson reach joins Kellett reach southward of the entrance to French river. Larkins point lies on the eastern bank at the southern

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Chart 3646.

end of Kellett reach, about 1¾ miles south-south-westward of Calliope point. Junk rock, with a depth of less than 6 feet (1m8) over it, lies about 1¾ cables northward of Larkins point, and is marked on its north-western side by a black conical light-buoy, exhibiting a *green fixed* light.

Bremer point, the southern extremity of French island, lies about one mile west-south-westward of Larkins point. High island, 121 feet (36m9) high, lies in mid-river, about 3 cables westward of Bremer point. A bank, portions of which dry 3 feet (0m9), extends about half a mile south-eastward from High island and nearly to the southern bank of the river. A shoal, with depths of from 5 to 6 feet (1m5 to 1m8) over it, lies between High island and the south-western bank of the river. The channel northward of the island is the only one used.

Comus rock, awash, lies about 1¼ cables eastward of High island and a short distance off the northern bank, narrowing the above-mentioned channel.

A light is exhibited, at an elevation of 14 feet (4m3), from a white iron column, on the northern extremity of High island (*Lat. 23° 02′ N., Long. 113° 23′ E.*).

A light is exhibited, at an elevation of 15 feet (4m6), from a red pole beacon, surmounted by a sphere, on Comus rock.

An islet lies about one cable northward of High island and half a cable offshore.

Brown reach lies between High island and Mann point, the eastern extremity of Chang shan, a low, flat island lying in mid-river, about 1¼ miles westward.

Yuan-kang sha or Chang shan divides the river into two channels; Senhouse reach is the southern and Yuan-kang or Maitland passage the northern of these channels.

Fenshuitau beacon stands on the northern bank of Yuan-kang, northward of Mann point.

Chart 3647.

Two shoals, each with a depth of 6 feet (1m8) over it, lie close together in the middle of Yuan kang, southward of the entrance to Elliot passage, which lies between Ting-tsun-tsui or Dent point, the western extremity of French island, and Tsao-tou-sha-wei or Melgrund point, the eastern extremity of Haddington island, about one cable south-westward.

For Elliot passage, *see* page 611.

Senhouse point lies on the southern side of Senhouse reach, about 6 cables east-south-eastward of Duff point, the western extremity of Yuan-kang sha.

The depths are about 6 feet (1m8) greater in Yuan-kang than in Senhouse reach.

Nanho tao.—Beacon.—Light.—Nanho tao or Back reach extends from Yuan-kang sha to Choutou tsui (Honam point), about 7 miles north-westward (chart 3620).

A hill, about 70 feet (21m3) high, lies a short distance within the southern bank, about 7 cables west-south-westward of Duff point; a bank, with a depth of 7 feet (2m1) over it, and reported, in 1922, to be extending northward, extends from the southern bank north-north-westward of this hill.

Charts 1739, 3588, 2562, 2661a, 2661b.

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Chart 3647.

Ta-shih barrier is the remains of an artificial obstruction about 1¾ miles westward of Duff point. In 1946, it was reported that considerable changes had taken place in the vicinity of Ta-shih barrier. A shoal, which dries, about half a mile long, lies off the southern shore and extends north-westward from near Clarke point, the western entrance point of Hamilton creek; another shoal, which dries, lies near the middle of the reach and extends about 3 cables south-eastward from opposite the entrance to Adams creek, which separates Haddington island from Lo ma chau.

A beacon stands on the southern side of the channel, about one cable north-westward of Hsia-ni-tang, situated about one mile north-westward of Clarke point (*Lat. 23° 02′ N., Long. 113° 18′ E.*).

Hamilton point lies on the north-eastern side of the reach, about 2¼ cables north-north-eastward of Hsia-ni-tang, and is the south-eastern entrance point of Adams creek.

In 1947, it was reported that considerable shoaling had taken place south-westward of Hamilton point, and that the drying bank in the middle of the channel had extended north-westward to the shore of Lo ma chau. Pai-he-tun-tou or Parker point, the western extremity of Lo ma chau, lies about one mile north-westward of Hamilton point. Between Pai-he-tun-tou and Tai-mei point, the eastern extremity of Marines island, about 3 cables west-north-westward, there is a bar between the southern branch of the river and the western end of Elliot passage (page 611).

The eastern entrance of Fatshan branch (page 637) lies between Tai-mei point and a point about 2¼ cables southward; a bank, with depths of less than 6 feet (1m8) over it, extends from the southern side of this entrance about half way across the reach, leaving a channel, half a cable wide, between its north-eastern edge and the western end of Lo ma chau.

A rock lies on the western side of the channel across the bar, about 1¼ cables westward of Pai-he-tun-tou.

A light is exhibited, at an elevation of 15 feet (4m6), from a red pole, with a circular daymark, on the edge of the reef on the south-western side of Pai-he-tun-tou.

A bank, with depths of less than 6 feet (1m8) over it, extends about three-quarters of a cable from the north-western side of Pai-he-tun-tou. In 1949, there was a least depth of 5 feet (1m5) on the bar.

Hsi yu chow or Sepoy island lies in mid-channel at the western end of Elliot passage, about 2 cables north-eastward of Tai-mei point.

That part of Nanho tao, which lies between the bar off Pai-he-tun-tou and Shamien (page 612) is known as Macao fort passage.

Macao fort and a pagoda are situated on an island, 70 feet (21m3) high, at the southern limit of Canton harbour, which is indicated on the chart, and on the western side of the channel, about 1¼ miles north-westward of Tai-mei point.

A bank, which dries, extends over one cable south-eastward from the island, and its northern side is fringed by a reef. A reef, which dries 2 feet (0m6), lies midway between the northern end of the island and the western bank of the river.

The northern end of Collinson creek, which separates Marines island from Gough island, lies southward of Macao fort (*Lat. 23° 04′ N., Long. 113° 15′ E.*).

Charts 1739, 3588, 2562, 2661a, 2661b.

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Chart 3647.

On the north-eastern side of Nanho tao, eastward of Macao fort, there is a ruined fort with a flagstaff, close to which is a jetty, known as the foreign cemetery jetty.

For the northern part of Nanho tao, *see* below.

Charts 3646, 3647.

Elliot passage. — Lights. — Light-buoys. — Since the removal of the beacons marking the Ta-shih barrier, in 1949, vessels proceeding to Canton use Elliot passage, entering it from Blenheim passage, between Ting-tsun-tsui (page 609), the western extremity of French island, and Tsao-tou-sha-wei, about one cable south-westward.

A conical light-buoy, painted red, exhibiting a *red fixed* light, is moored about one cable southward of Ting-tsun-tsui; its position is approximate.

Li-chiao or Elliot barrier, situated about 1½ miles north-westward of Ting-tsun-tsui, extends across Elliot passage from Cha-pei-tsui or Fletcher point, the western extremity of Bethune island, to Washington point, about 3¾ cables southward. The channel through the barrier, which is 164 feet (50m0) wide, had a least depth of 4 feet (1m2) in 1949, and is marked by light-buoys.

A light is exhibited from a red beacon on the southern side of Bethune island, about 3¾ cables east-south-eastward of Cha-pei-tsui.

A light is exhibited from a white beacon on the northern side of Haddington island, about 3½ cables westward of the southern end of Li-chiao barrier.

A conical light-buoy, painted red, exhibiting a *red fixed* light, is moored close off the western extremity of Long island, about 8½ cables westward of the southern end of Li-chiao barrier.

A black conical light-buoy, exhibiting a *green fixed* light, is moored about 1¼ miles west-north-westward of Long island; its position is approximate.

Ho-nan tao and Actæon island, divided by a creek which connects this passage with Whampoa channel northward, form the northern side of Elliot passage; Lo ma chau, Haddington and French islands form the southern side.

The channel, on the southern side, through the opening between Haddington and French islands is reported to be tortuous; there are numerous fishing stakes in its northern entrance.

Towards its eastern end, Elliot passage is divided into two channels by Dove island. These channels meet again at the western end of American reach (page 605).

CANTON HARBOUR.—The southern, eastern, and western limits of Canton harbour, which are indicated on chart 1739, are described on pages 610, 607 and 613, respectively.

Chart 3620.

Northern part of Nanho tao. — Light. — Dangers. — Light-buoys.—Choutou tsui or Honam point, the western extremity of Ho-nan tao, lies about 2 miles north-north-westward of Macao fort (*Lat. 23° 04′ N., Long. 113° 15′ E.*). On both sides of Nanho tao there are wharves, the positions of which may best be seen on the chart, and numerous mooring buoys are situated on the edge of the bank extending from the south-western side.

A light is exhibited, at an elevation of 20 feet (6m1), from a red iron framework tower, on Choutou tsui.

Charts 1739, 3588, 2562, 2661a, 2661b.

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Chart 3647.

Macao fort rock, with a depth of 8 feet (2m4) over it, lies about one cable north-north-eastward of Macao fort; it is marked on its north-eastern side by a black conical light-buoy, exhibiting a *green fixed* light.

Haeshin rock, with a depth of 9 feet (2m7) over it, lies a little over half a cable north-eastward of Macao fort rock and less than half a cable off the north-eastern side of the harbour; it is marked, on its south-western side, by a red conical light-buoy, exhibiting a *red fixed* light.

Vessels must pass between these two light-buoys.

Chart 3620.

Pakhinhok yen, with a depth of 6 feet (1m8) over it, lies about one mile northward of Macao fort, and less than half a cable off the eastern side of the harbour; it is marked, on its south-western side, by a red conical light-buoy, exhibiting a *red fixed* light.

Shachung yen, with a least depth of 10 feet (3m0) over it, lies about one mile southward of Choutou tsui, and a quarter of a cable off the western side of the harbour; it is marked by a black conical light-buoy, exhibiting a *green fixed* light.

Fenghuang chiao or Birds Nest rocks are two rocks close together, with a least depth of one foot (0m3) over them, lying about half a mile south-south-eastward of Choutou tsui, and a short distance off the eastern side of the harbour; they are marked, on their south-western side, by a red conical light-buoy, exhibiting a *red fixed* light.

A shoal, with a depth of 10 feet (3m0) over it, lies about three-quarters of a cable west-south-westward of Choutou tsui light-structure. A bank, with depths of less than 12 feet (3m7) over it, extends one cable from the south-western shore south-westward of Choutou tsui. Fong chuen yen, with a depth of 7 feet (2m1) over it, lies about 2¼ cables westward of Choutou tsui, and half a cable from the south-western shore; it is marked on its northern side by a black conical light-buoy, exhibiting a *green fixed* light.

Hsi ho tao. — Light. — Dangers. — Light-buoys. — Between Choutou tsui (*Lat. 23° 06′ N., Long. 113° 14′ E.*) and a point on the south-western side of Nanho tao, abreast it, the harbour trends north-westward for about 1¾ miles to its western limit, and is known as Hsi ho tao (West reach).

The northern end of Huati chi or Fati creek, which connects the harbour with Fatshan branch (page 637), is situated on the south-western side, about three-quarters of a mile westward of Choutou tsui, and the terminus of the Canton-San-shui railway, with a pier, lies on the same side of the harbour, about a quarter of a mile farther north-westward. Oliver point lies about one cable south-eastward of the railway pier.

Shamien or Shameen, an island, separated from the mainland by a canal, crossed by two bridges, lies on the northern side of the harbour, about 2 cables northward of Choutou tsui. The British Consulate is situated in the middle of the southern side of the island, with the United States and French Consulates eastward of it. The English church stands near the western end of the island.

The British Consulate jetty, from which a light is exhibited, is situated on the southern side of Shamien.

Huangsha or Wongsha wharf, of the Canton-Hankow railway, is

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Chart 3620.

situated on reclaimed land extending about half a mile west-north-westward from Shamien.

The southern extremity of Nuiku sha or Belcher island lies 6 cables north-north-westward of Oliver point; here the harbour is divided into two branches. Starling reach, the northern branch, leads to Nemesis and Sulphur reaches, and the north-western branch leads to Encounter reach.

Chart 1739.

The western limit of the harbour extends in a north-easterly and south-westerly direction, across both the above-mentioned branches of the harbour, about 4 cables north-westward of the south-eastern extremity of Nuiku sha.

Close above the western limit, two bridges were under construction in 1935, one across each branch.

Chart 3620.

Hua ti yen or Fati rock, with a depth of 8 feet (2^{m}4) over it, lies 3¼ cables west-north-westward of Choutou tsui, and about three-quarters of a cable from the south-western side of the harbour; it is marked on its north-eastern side by a conical light-buoy, painted in red and black chequers, exhibiting a *red fixed* light.

Shamien yen, with a depth of 12 feet (3^{m}7) over it, lies about 3½ cables westward of the British Consulate jetty, and one cable from the reclaimed land on the northern side of the harbour. The shoalest part of this rock is marked by a conical light-buoy, painted in red and black chequers, exhibiting a *red fixed* light.

Shek wei tan yen, with a depth of 10 feet (3^{m}0) over it, lies nearly in mid-river, about 1¾ cables north-eastward of Oliver point (*Lat. 23° 07′ N., Long. 113° 13′ E.*), and is marked on its northern side, by a black conical light-buoy, exhibiting a *green fixed* light.

A rock, with a depth of less than 6 feet (1^{m}8) over it, lies about half a cable north-north-eastward of Oliver point, and a rock, awash, lies close eastward of the outer end of the Canton-San-shui railway pier.

Wongsha yen, awash, with two rocks, with depths of less than 6 feet (1^{m}8) over them, close eastward, lies in the middle of the river, about 3 cables north-north-westward of Oliver point. These rocks are marked, on their north-eastern side, by a black conical light-buoy, exhibiting a *green fixed* light.

A rocky patch, with a depth of 4 feet (1^{m}2) on its south-eastern edge, lies about half a cable south-westward of Wongsha yen, and a rock, awash, lies about 1¼ cables southward of the same rock, and half a cable off the south-western side of the harbour.

Ta yung k'ou.—Ta yung k'ou or Front reach extends east-north-eastward from a line joining Choutou tsui and Shamien to Huang-pu channel (page 603). Large areas were being reclaimed, in 1935, on the south-eastern side of the reach between Choutou tsui and Hai-chu bridge, which spans the harbour about 1¼ miles east-north-eastward; this bridge has a clearance of 27 feet (8^{m}2) at high water.

A tower and the Customs signal station are situated on the south-eastern side of the harbour, about 2 cables eastward of Choutou tsui; a tower, with a flagstaff, is situated on the north-western side of the harbour, about 2¾ cables north-eastward of the Customs signal station.

Charts 1739, 3588, 2562, 2661a, 2661b.

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Chart 3620.

Tidal streams.—The ebb tidal stream in Macao fort passage attains a rate of from 3 to 4 knots at times.

Tide-gauges.—A tide-gauge is established at the British Consulate jetty, and at the foreign cemetery jetty, situated on the north-eastern bank, eastward of Macao fort (chart 3647).

Anchorages.—Directions.—Foreign vessels can anchor anywhere within the limits of the harbour, indicated on chart 1739, with the exceptions mentioned below.

The anchorage for vessels carrying mineral oil, etc., is in that part of the harbour which is situated between Fenghuang chiao and Vegetable creek, about one mile southward on the south-western side.

Chart 3647.

The anchorage for vessels carrying explosives, or highly inflammable cargo, is in that part of the harbour which is situated between Vegetable creek and Macao fort (*Lat. 23° 04′ N., Long. 113° 15′ E.*).

The quarantine anchorage is southward of Macao fort light-buoy westward of the fairway; vessels must anchor in single line well clear of the fairway.

Vessels entering Canton harbour are boarded by the Berthing officer, who will direct them to proper berths, and they must moor in accordance with the orders received from the Harbour master, and must not shift berth without permission. A vessel mooring after dark must be ready to shift berth in the morning should she be required to do so by the Berthing officer.

Vessels anchoring in Nanho tao between Macao fort and Choutou tsui must keep as close to the eastern shore as possible compatible with their length.

Prohibited anchorages.—Vessels are prohibited from anchoring between a position about 220 yards (201^{m}2) southward of Choutou tsui and Shamien yen light-buoy, and in Ta yung k'ou between Choutou tsui and Hai-chu bridge. Vessels, except cargo boats, are not permitted to anchor off Shamien.

Chart 3620.

Climatic table.—*See* page 60.

Regulations.—Vessels entering Canton harbour should not be of a greater overall length than 300 feet (91^{m}4) and those for Huang-pu should not exceed 400 feet (121^{m}9).

When vessels are warping to or from mooring buoys or wharves, and when swinging at wharves, a black ball 4 feet (1^{m}2) in diameter must be displayed at the foremast-head, and no vessel shall commence to warp or swing until such ball has been displayed for ten minutes.

No ballast, ashes, etc., may be discharged overboard. A licensed ash boat will attend if flag Y of the International Code of Signals is displayed at the fore.

Searchlights or arc lights must not be used in such a manner as to embarrass navigation.

Whistles or sirens are not allowed to be sounded except for the purpose of signalling in accordance with the Regulations for Preventing Collisions at Sea, or for the purpose of warning vessels of danger.

No vessel except men-of-war may use swinging booms; these shall be rigged in from sunset until sunrise.

In case of fire the ship's bell must be rung continuously, and by ships above and below her, the signal NQ of the International Code

Charts 1739, 3588, 2562, 2661a, 2661b.

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Chart 3620.

of Signals, being displayed by day, and a light lowered and hoisted continuously by night, notice being immediately given to the Harbour master's office, and to the nearest Municipal Police station.

Vessels are advised not to navigate Hsi ho tao during night time or Ta yung k'ou with the tidal stream.

All vessels under way in the port are to proceed at such a reduced speed as will not cause displacement waves which may damage property ashore or afloat.

Vessels with cargoes of explosives shall display a red flag, and anchor as directed on page **614**.

A vessel arriving with infectious disease on board must anchor as directed, and shall display a yellow flag at the fore, and not allow anyone to disembark or come on board without the permission of the Quarantine authorities.

The above regulations are also in force at Huang-pu anchorage.

Signals.—Special signals may be made at Canton and Huang-pu. *See* page **24**.

Mooring buoys.—There are numerous mooring buoys off Shamien for men-of-war and merchant vessels.

Canton.—The name Canton is a corruption by the Portuguese, the earliest Europeans to visit China, of the name of the Province of Kwangtung. Canton, also known to the Chinese as Kuang-Chou, is the capital of that province and stands on the northern bank of the Chu chiang.

In the northern corner of the city is the City hill (Kan Yin hill) on which is a five-storied pagoda. There is also a memorial cenotaph forming the highest landmark of the city. At the foot of the hill is the City hall, one of the largest public buildings in China.

In 1945, the population was about 1,500,000, including about 500 Europeans and Americans.

Consular officers.—British Consular officers reside at Canton.

Storm and other signals.—Storm signals, similar to those displayed at Hong Kong (page **497**), are shown, both day and night, at the yard-arm of the Customs signal station (*Lat. 23° 06′ N., Long. 113° 15′ E.*), and on the northern side of Ta yung k'ou, from a mast on the top of the Examination shed opposite the Custom house.

For signals used in Chinese ports, *see* page **24**.

Wharves.—The principal wharves in Nanho tao are the oil wharf, 2,044 feet (623^{m}0) long, with a depth of 12 feet (3^{m}7) alongside, and the wharf for the coastal steamers, 4,643 feet (1,415^{m}2) long, also with a depth of 12 feet (3^{m}7) alongside.

In Ta yung k'ou, the principal wharf is 680 feet (207^{m}3) long, with a depth of 10 feet (3^{m}0) alongside.

There are 20 berths in Nanho tao and Hsi ho tao.

Port facilities.—Small quantities of fuel oil can usually be obtained from the oil Companies.

Small repairs to vessels can be carried out.

Communication.—There is regular steamer communication with Hong Kong, Macao, and Ts'ang-wu; also with places up the Pei chiang and Tung chiang.

Canton is connected by railway to Hong Kong, San-shui and Hankow.

Canton is connected to the general telegraph system.

Charts 1739, 3588, 2562, 2661a, 2661b.

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Chart 3620.

Trade.—The principal imports are cotton and woollen piece goods, kerosene, rice, sugar, etc., and exports silk, matting, cassia, preserves, canes, feathers, etc.

Charts 3026, 3588.

GENERAL DIRECTIONS.—Hong Kong to Belcher reach and to Canton by Blenheim and Elliot passages.—In 1924, it was recommended by H.M.S. *Hollyhock* that a vessel drawing 13 feet (4m0), with a speed of 10 knots, proceeding to Canton from Hong Kong, should leave the latter port at about the time of high water in order to carry the flood stream in the river with her.

Charts 3632, 3681.

From Hong Kong harbour, a vessel should proceed through Kap shui mun (page 581), and then pass northward of The Brothers and through Urmston road (page 591). From about half a mile off Black point (*Lat. 22° 24′ N., Long. 113° 54′ E.*), she should steer to pass half a mile south-westward of Tzu chou ; Syah islet should not be opened of Tzu chou until South-west point (page 592) bears about 101°, when it should be opened in order to clear the bank extending south-eastward from Tzu chou.

When Tzu chou is abeam the vessel should steer about 326°, passing through Fan shih shui tao, to Chuen pi channel, observing that the eastern side of Ta-hu (page 600), bearing about 324° and well open eastward of Shan-pan chou (page 596), leads eastward of Ling-ting Shuan chou. The vessel may be set somewhat across Fan shih shui tao, and care should be exercised when proceeding southward in thick weather.

Charts 1741, 1740.

After having given a sufficient berth to Pratt rock (page 599) in Chuen pi channel, the vessel should pass through Boca Tigris, as directed on page 600 and pass eastward of Duff rock, taking care to avoid the 3-fathom (5m5) patches about half a mile south-eastward of it ; then she should close Ta-hu to avoid Tauling flat, and having passed eastward of Bate rock, she should steer so as to pass from 3 to 4 cables westward of Tauling island and about 2 cables off the light-structure near Blake point, and should keep that distance off the eastern shore until in a position about three-quarters of a mile northward of Blake point, when the distance off the eastern shore should be increased to about 4 cables.

Charts 1740, 1742.

Amherst point should be passed at a distance of about 4 cables. Course can then be altered towards Maxwell point, and thence altered so as to pass close westward of the two unlit light-buoys (page 602) westward of Second bar. The vessel may then continue up the western channel towards the black conical buoy moored off Meek point (page 602). Course should then be altered so as to pass about 3 cables from the tide-gauge and light-beacon, situated about 1½ miles north-north-westward of Meek point, thence through Belcher reach to Collinson barrier, passing southward of the red conical buoy moored on the spit extending south-eastward from Flat island No. 1.

The northern edge of the shoal extending from the southern shore in Blenheim reach can be avoided by keeping Signal hill, on Danes island, bearing 280°.

Charts 2562, 2661a, 2661b.

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Chart 3646.

The vessel must pass through the opening in Collinson barrier, and thence, favouring the north-western bank for about one mile, haul into midstream before reaching Sin Nanzing rock, which should be passed on its south-eastern side.

She must pass westward of Junk rock, and round Bremer point closely in order to avoid the bank extending south-eastward from High island; thence she must pass between Comus rock and High island light-beacons, into Brown reach, giving Comus rock light-beacon (*Lat. 23° 02′ N., Long. 113° 28′ E.*) a berth of a quarter of a cable, but not more than half a cable, and passing close northward of High island.

Charts 3647, 3620.

The vessel should continue through Brown reach in mid-channel and enter Yuan kang at a distance of half a cable southward of Fen shui tau beacon. The greatest depths in Yuan kang lie somewhat northward of mid-stream.

Thence the vessel should proceed through the passage between French and Haddington islands into Elliot passage, thence through Li-chiao barrier, thence south-westward of Hsi yu chow, thence in mid-channel to Macao fort island, and between Macao fort rock and Haeshin rock light-buoys, and thence keep in mid-channel, passing westward of Pakhinhok and Fenghuang chiao light-buoys, and eastward of Shackung yen light-buoy; thence to the desired anchorage.

Charts 3588, 2562.

CHANNELS BETWEEN THE HSI CHIANG AND THE CHU CHIANG.—In the delta south-eastward of San-shui (*Lat. 23° 11′ N., Long. 112° 50′ E.*) (page 567), lying between the lower reaches of the Hsi chiang on the south-western side, and the lower reaches of the Chu chiang and its estuary, on the north-eastern side, there is a large tract of alluvial land, which is intersected by a network of channels and creeks. A considerable portion of this delta has been reclaimed by embankments.

The principal channels traversing the delta fall into the Chu chiang estuary between Chinhsing men (page 588) and Second bar (page 602), but they are connected with the two main rivers throughout their whole length, by smaller channels with branches to all the principal towns and districts in the delta.

The channels for the most part run through level country, dotted with many isolated hills. The waters are kept in their channels by artificial embankments, without which almost all the rice fields would be flooded at high water. The rice lands are principally eastward of Shun-te (Taileung) (*Lat. 22° 50′ N., Long. 113° 15′ E.*); westward of that town the land is more elevated, being above the level of high water, and is cultivated with mulberry plants.

The embankments are wide, but being planted with fruit trees, with here and there dwellings, leave only a narrow path for foot passengers. The rivers and numerous canals are used for communication and transport. The towns are entered by water, the channels being staked across; in some cases an entrance is left wide enough to admit a large junk, the opening being closed by rude gates, as at T'an-chou (page 622); in others, these barriers consist of rows of stakes, with their heads above water, closely driven across the whole breadth of the river, leaving only a narrow and circuitous channel near

Charts 2661a, 2661b.

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Charts 3588, 2562.

one bank, through which the current runs with great strength, and often the stakes are level with low water, forming a considerable danger to navigation.

Passenger traffic on a large scale is carried on in the channels of the delta by means of junks, about 80 feet (24m4) long, 20 feet (6m1) beam, and of 2½ feet (0m8) draught, which are towed by steam launches.

Tides.—Tidal streams.—During the summer months (May-September), the heights of tide and set of the tidal streams are uncertain and variable in the creeks of the delta, depending upon the levels of the Hsi chiang and Pei chiang.

In Saiwan, Li-ch'i hung, Taileung, and Junction channels the flood tidal stream sets westward, and the ebb eastward. In summer, when the day tides are higher, the water is high nearly all day at springs in some of these channels, owing to the day tide only falling about 2 feet (0m6).

General information.—Caution.—*See* page 527.

Rule of the road.—*See* page 527.

Pilots.—A pilot should be employed in all these channels and can generally be obtained, but very few know all the creeks in the delta. *Chart 3588.*

Nemesis creek.—Telegraph cable.—Nemesis creek connects Lo chou men (Mo to mun) (page 531) with the town of Chung-shan (Heungshan). It can be entered from southward either between the north-western extremity of Mo tao (*Lat. 22° 18′ N., Long. 113° 20′ E.*) and the south-eastern extremity of an island, 2½ cables north-westward, or from the northern end of Grindstone creek (page 531). There are few dangers in Nemesis creek and these are close inshore; the least depth in the creek is 4 feet (1m2), during the low-river season, near its northern end. A groyne extends about 50 yards (45m7) from the eastern bank of the creek just within the southern entrance. There is a guard station about 4 miles north-north-westward of this entrance, and, a short distance farther northward, a spit extends from the western bank. About 2¼ miles northward of the guard station there is a ferry, and a rock lies off the eastern bank in this vicinity. The village of Ta-yung (Taichung) stands a short distance inland from the western bank about 3 miles farther north-north-westward. A joss house stands on the western bank about 2¼ miles north-eastward of Ta-yung, and, about 1¼ miles eastward of the joss house, a pier extends from the southern bank; opposite this pier, a bank extends from the northern shore.

There is a stone bridge over a creek, which enters the eastern side of Nemesis creek, about one mile north-eastward of the last-mentioned pier. Between the stone bridge and Chung-shan, about 1½ miles northward, the creek widens.

Abreast Chung-shan the navigable width of the creek is, however, considerably reduced by junks moored to both sides and is also restricted by traffic.

At Chung-shan the northern end of Nemesis creek joins the eastern end of Shekkei creek (page 619).

There is a hospital at Chung-shan.

A creek, about one mile long, enters the above-mentioned junction from north-eastward. At its northern end, this creek is joined by the southern end of Konghau creek (page 619), and also by the south-

Charts 2661a, 2661b.

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Chart 3588.

western end of a creek coming from the western end of Heng men (page 594). Here there are three banks, extending, respectively, from the northern entrance spit, from an inlet on the western bank, and from an inlet on the southern side of the junction, leaving a narrow but deep channel between them which should be navigated with extreme care.

An overhead telegraph cable crosses this short creek a short distance northward of Chung-shan.

There is good anchorage between the overhead telegraph cable and the eastern entrance of Shekkei creek.

Shekkei creek.—The south-western end of Shekkei creek (page 532) is entered close eastward of Kep siang, an island in the Hsi chiang and, trending in a north-easterly and easterly direction, joins the northern end of Nemesis creek at Chung-shan, as described above. Shekkei creek is very narrow in places and is extremely tortuous; although used by tows, it is not recommended.

Konghau creek.—This creek connects the short creek north-eastward of Nemesis creek with Dom Joao loop. Its southern entrance is restricted by the shoals previously mentioned. The village of Chiang-k'ou (Konghau) (*Lat. 22° 36′ N., Long. 113° 23′ E.*) is situated near the northern end of the creek, about $2\frac{3}{4}$ miles northward of its southern entrance. A bank extends from the western side of the creek at its junction with the loop.

Tides.—During the low-river season the tidal range in Nemesis, Shekkei, and Konghau creeks, is about the same as that at Hong Kong. At Chung-shan high water is about 3 hours after high water at Hong Kong.

Dom Joao loop.—The northern end of Konghau creek is connected with Siulam channel, about $1\frac{1}{2}$ miles north-westward, by the western portion of Dom Joao loop. The eastern portion of this loop leads into a channel which is connected with the western end of Heng men, and which is described on page 620.

Lung kong creek.—The southern entrance of this creek lies north-eastward of Kep siang (page 532). Lung kong creek runs nearly parallel with the Hsi chiang from its southern entrance to Simon point, about 17 miles north-north-westward, where it joins Junction bend (page 625).

There are three barriers in Lung kong creek; two of these are nearly midway between the southern and northern ends of the creek, and the third about one mile from its northern end. Over the last barrier a depth of 3 feet (0^m9) is indicated on the chart, which appears to be the least depth in the creek.

Sandpiper creek.—This creek, which lies between Lung kong creek and the Hsi chiang, is described on page 537.

Channels leading from the western end of Heng men to the Hsi chiang.—About $2\frac{1}{2}$ miles westward of the Custom house in Heng men (page 595) is the entrance to a channel leading in a south-westerly direction to the southern end of Konghau creek. This channel is clear and deep for the most part, but gradually narrows until within one mile of its south-western end, where there are three sharp bends, and the channel becomes very narrow, with depths in the fairway of from 4 to 5 feet (1^m2 to 1^m5). At its junction with Konghau creek are the three shoals already mentioned. This channel should be entered

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Chart 3588.

about 2 hours after high water at Hong Kong in order to obtain the best water at its junction with Konghau creek.

About 1½ miles westward of the eastern entrance to the above-mentioned channel is the entrance to a creek leading to the eastern portion of Dom Joao loop. There is a stone barrier in this creek, and although apparently wide and deep the creek has not been investigated.

Siulam channel.—About 2½ miles westward of the Custom house in Heng men, a large groyne, generally marked by eddies, projects from the northern bank of the channel. About one mile north-westward of this groyne are the south-eastern entrances of Siulam and Kerr channels. A spit extends from the south-eastern extremity of Ta nan sha (Tainamsha), an island which divides the two channels.

Siulam, the southern of these two channels, is fairly narrow, and has a least depth of 9 feet (2m7); it is used by river steamers proceeding to Chiang-men and Ts'ang-wu, being shorter and safer than Kerr channel. About 2½ miles west-north-westward of the entrance there is a creek running southward, connecting Siulam channel with the eastern end of Dom Joao loop, and another creek running northward, connecting it with Kerr channel. The junction with the western end of Dom Joao loop is about 3 miles farther westward.

Robin creek (page 621) joins Siulam channel from northward about 1¾ miles north-westward of the western end of Dom Joao loop; there is a depth of 9 feet (2m7) in this part of the channel. In 1936, there was a prominent tree on the eastern side of the southern entrance to Robin creek. Kubo, a village near which there is a tower, stands on the northern bank of Siulam channel, about 2 miles westward of the southern entrance to Robin creek, and Yee on joss house is situated on the south-western bank of the channel about 1¾ miles farther north-westward.

About 9 miles north-westward of the southern end of Robin creek, Siulam channel joins Junction bend, Junction channel, and the southern end of Yellow reach (page 625). Parrots beak, on which is a tower (*Lat. 22° 43′ N., Long. 113° 14′ E.*), is situated on the north-eastern side of Siulam channel at this junction. A bank, with depths of less than 6 feet (1m8) over it, extends about half a cable south-westward from Parrots beak.

Vessels emerging from the north-western end of Siulam channel, should keep a sharp lookout for river traffic, as four channels meet here.

The town of Hsiao-lan-chen (Siulam) is situated nearly midway between Siulam channel and Lung kong creek, and about 2 miles southward of Parrots beak.

Tidal stream.—A strong north-going current sets across the north-western entrance of Siulam channel during high river.

Kerr channel.—Dangers.—Kerr channel leads in a north-westerly direction from the western end of Heng men to the northern end of Yellow reach. There is a police tower on the north-eastern bank at the entrance to Kerr channel. About 3 miles from its entrance, Kerr channel is connected by a creek with Siulam channel and about 2 miles farther north-westward, Robin creek (page 621) enters from westward.

About 2 miles northward of its junction with Robin creek, Kerr channel is joined from north-eastward by Chu sha li creek (page 623). Flat point is the eastern entrance point at the southern end of Chu

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Chart 3588.

sha li creek. A spit extends a short distance from the south-western bank, about a quarter of a mile south-westward of Flat point.

About 2 miles west-north-westward of Flat point, Wantung junction (page 623) enters Kerr channel from northward. On the western entrance point of the junction there was, in 1936, a prominent tree. Telegraph cables cross the channel by this tree, but the northern bank can be closed to 20 yards (18m3). Close eastward of the junction there is a rock, awash, in midstream, and some rocks off the southern bank, a short distance farther eastward; vessels should pass between these dangers and the northern bank.

Middle hill, about 130 feet (39m6) high, lies about half a mile inland from the southern bank, near the above-mentioned dangers. Crater hill, 170 feet (51m8) high, lies a short distance inland from the northern bank, and about 2 miles north-westward of Middle hill.

There is an islet in mid-stream southward of Crater hill (*Lat. 22° 42′ N., Long. 113° 20′ E.*).

About 2½ miles westward of its junction with Wantung junction, Kerr channel is divided by a low island, off both ends of which there are small sand spits. The channel on the north-eastern side of this island should be used; that on the south-western side was reported, in 1927, to be silting up, and there is a bar, with a depth of 6 feet (1m8) over it, at its northern end.

Mohr rock, with a depth of 4 feet (1m2) over it, lies on a spit which extends a short distance from the western bank, abreast the northern end of the last-mentioned island.

Hand rock, with a least depth of 9 feet (2m7) over it, lies about 2 cables northward of the northern end of the same island, and a short distance off the south-western side of Kerr channel; vessels should pass between Hand rock and the north-eastern side of the channel.

About 1½ miles north-north-westward of Hand rock, Kerr channel is joined from north-eastward by Yungki junction (page 624), and about 1¾ miles farther north-westward it joins the northern end of Yellow reach and the southern end of Taileung channel (page 624).

A bank extends from the southern side of Kerr channel at its junction with Yellow reach.

Robin creek.—This creek connects Siulam and Kerr channels, about 5½ miles north-westward of their common entrance. Robin creek is reported to have a least depth of 4 feet (1m2), and a width of from 40 to 60 feet (12m2 to 18m3); it has two difficult turns and can only be navigated by short vessels of very shallow draught.

Li-ch'i hung.—Telegraph cables.—Beacon.—Li-ch'i hung (Tamchau channel) is the largest in the delta. Its entrance is close westward of Heng men entrance beacon (page 595), between which and Bullock point, about 20 miles north-westward, there was, in 1936, a least depth of 9 feet (2m7) in the fairway of the channel. The channel runs along the south-western side of Swashway bank (page 594) for about 4 miles to where the bank is connected with a stone embankment. On the south-western side of this part of the channel there are a number of islands, the positions of which can best be seen on the chart. Near the north-western end of the north-westernmost of these islands an overhead telegraph cable, indicated on the chart, crosses Li-ch'i hung. About 4 miles farther north-westward, Chu sha li creek (page 623)

Charts 2562, 2661a.

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Chart 3588.

joins Li-ch'i hung from south-westward, and South Centre junction (page 630) joins it from north-eastward. North Centre junction (page 630) joins the channel from north-eastward, a short distance farther north-westward.

A small grass-covered islet lies at the south-eastern end of a shoal which occupies a considerable area in the centre of the channel at these junctions; part of this shoal dries 3 feet (0m9). The islet and the shoal can be passed on either side, but the channel passing eastward and northward is the more intricate.

Wantung junction (page 623) joins Li-ch'i hung from south-westward about 2¼ miles westward of the south-western end of North Centre junction, and, about 1¾ miles farther north-westward, a creek, which connects Li-ch'i hung with Yungki junction, joins from westward. Shell island, with a spit extending a short distance from its southern end, lies in mid-channel about 1¼ miles north-westward of the last-mentioned creek. An islet lies off the south-western side of Shell island abreast the north-eastern end of Yungki junction (page 624).

The town of Tan-chou (Tamchau) (*Lat. 22° 47′ N., Long. 113° 23′ E.*) stands on the north-eastern side of Li-ch'i hung abreast the southern end of Shell island. Some hills, known as Shih-pa-lo-han (Tamchau Quoins), one of which is 450 feet (137m2) high, lie a short distance north-eastward of the town. Bullock point lies on the western side of Li-ch'i hung about one mile north-westward of Shell island. A spit extends one cable south-eastward from Bullock point. Taileung creek (page 627) and Taileung channel (page 624) join Li-ch'i hung from westward close southward of Bullock point.

At Essex point, the northern extremity of Patshawai, about 5 miles north-north-westward of Bullock point, Li-ch'i hung is joined, from eastward, by Saiwan channel (page 632). About 1½ miles southward of this junction, two stone groynes extend almost half way across the channel from the western bank.

Tsznai, an island, lies on the north-eastern side of Li-ch'i hung, northward of Essex point. At the north-western end of Tsznai there is a short channel connecting Li-ch'i hung with Chunchune channel (page 634).

About 1½ miles westward of Tsznai, Li-ch'i hung is joined from the westward by Brick kiln creek (page 627). Between Essex point and Brick kiln creek, Li-ch'i hung is clear except for the rocks indicated on the chart which are close inshore. A spit, with an above-water rock near its outer end, extends a short distance from the northern entrance point of Brick kiln creek, and a short distance north-westward of that point there is a depth of only 2 feet (0m6) in Li-ch'i hung.

The town of Lin-t'ou (Lamtau) stands on the western side of Li-ch'i hung about 2 miles north-westward of its junction with Brick kiln creek.

Ch'en-ts'un-hsü (Chanchuen) stands on the north-eastern side of Li-ch'i hung, about 2 miles northward of Lin-t'ou. This town is encircled by two small creeks which connect Li-ch'i hung with Chunchune channel; the village of Komtsun is situated on the western side of the mouth of the western of these two creeks.

The village of Tangchow is situated on the northern bank of Li-ch'i hung, about 2½ miles westward of Komtsun. Starling rock lies close off the northern bank about 3 cables eastward of Tangchow. There are two islands abreast Tangchow which occupy the greater part of the river.

Charts 2562, 2661a.

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Chart 3588.

A short distance westward of Tangchow, Li-ch'i hung is joined from north-eastward by Moneypenny creek (page 636).

The village of Lanshek is situated on the northern bank of Li-ch'i hung, about 1½ miles westward of its junction with Moneypenny creek. There are some rocks close off both banks in the vicinity of Lanshek; the positions of these rocks can best be seen on the chart.

An overhead telegraph cable crosses the channel close eastward of Lanshek.

A short distance westward of Lanshek, Kat lee creek (page 629) joins Li-ch'i hung from westward. A drying spit, on the outer end of which is an islet, with a sunken rock close eastward, extends nearly half a mile from the northern side of the entrance to Kat lee creek. The northern side of the islet is marked by a beacon, and there is a rock, which dries one foot (0m3), close off the northern bank abreast it.

The village of Shih-wan (Shekwan) stands on the north-eastern bank of Li-ch'i hung, about 1½ miles north-westward of its junction with Kat lee creek, and, about 2 miles farther north-westward, there is a bar, with a depth of 2½ feet (0m8) over it.

Chart 2734.

About one mile north-westward of the last-mentioned bar, Fatshan channel (page 637) joins Li-ch'i hung from north-eastward. Fatshan channel leads to the town of Nan-hai (Fatshan), page 636. A rock, the existence of which is doubtful, was reported, in 1908, to lie off the south-western bank of Li-ch'i hung nearly opposite the mouth of Fatshan channel.

About 2 miles westward of its junction with Fatshan channel, Li-ch'i hung enters Fat shan branch (page 637), which leads to Sanshui. The village of Shahow stands on the northern side of Li-ch'i hung, about one mile north-eastward of this junction. Some rocks and an islet lie close off the northern bank abreast Shahow (*Lat. 23° 03′ N., Long. 113° 01′ E.*).

The village of Tsi tung stands on the southern bank, just within the western end of Li-ch'i hung. A rock lies close off Tsi tung and a drying spit extends from the southern entrance point of the channel. A groyne extends from the northern entrance point, and, close eastward of the groyne, a drying bank, the extent of which can best be seen on the chart, extends from the north-western side.

There was a depth of only 18 inches (0m5), in 1898, over the bar at the western end of Li-ch'i hung.

Chart 3588.

Chu sha li creek.—This creek joins Kerr channel and Li-ch'i hung and is narrow but deep. The least depth is 13 feet (4m0) over the bar at the north-eastern end of the creek (page 621). A spit extends about one cable from the northern point of the eastern entrance.

Chu sha li creek is connected with Wantung junction by Chu sha li junction, the eastern end of which is situated about half way through Chu sha li creek, on its north-western side; the junction is reported to be navigable by vessels drawing up to 5 feet (1m5).

Wantung junction.—This junction is situated about 2 miles westward of Chu sha li creek and connects Kerr channel and Li-ch'i hung. At its southern entrance (page 621) there was a bar with a depth of 4 feet (1m2) over it, in 1936. The town of Huang-lou (Taiwongpu), with Sharp hill, 370 feet (112m8) high, close eastward, is situated on

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Chart 3588.

the north-western bank of Wantung junction about 1½ miles northward of its southern entrance.

Bone hill, about 100 feet (30m5) high, lies on the opposite side of the junction, about one mile south-south-eastward of Sharp hill, and Lime hill, 320 feet (97m5) high, lies on the north-western side of the junction, about 2 miles east-north-eastward of Sharp hill.

Yungki junction.—This junction connects Kerr channel and Li-ch'i hung, north-westward of Wantung junction; its northern entrance is situated about 2¼ miles south-eastward of Bullock point (page 622). About 2 miles from its northern entrance, it is connected with Li-ch'i hung by a shallow creek, running in an easterly direction.

Taileung channel.—Telegraph cable.—Buoys.—Taileung channel connects Li-ch'i hung with the northern end of Yellow reach. Brine island, which is flat and divided by a cutting near its south-western end, lies a short distance within the north-eastern entrance of Taileung channel. On the northern side of this entrance Taileung creek is entered between Bullock point and Kerr point (*Lat. 22° 48′ N., Long. 113° 19′ E.*), about three-quarters of a mile westward; an islet, with a spit extending a short distance eastward from it, lies close off Kerr point.

Vessels can pass on either side of Brine island; the channel north-westward of it is clear as far as the south-western end of that island where it is barred by Taileung rocks, over which there is a depth of 4 feet (1m2). There is a passage, about 50 yards (45m7) wide, in the fairway of which there are depths of from 6 to 8 feet (1m8 to 2m4), close to the bank northward of these rocks, which are situated abreast the entrance of a small creek with numerous trees growing on its bank, the only trees in the vicinity. Between Taileung rocks and Brine island there is a passage, in the fairway of which there is a depth of about 12 feet (3m7), but it is very narrow and difficult, and made more so by chow chow water.

There is deeper water in the channel south-eastward of Brine island. Tonze rock lies close off the south-eastern side of this channel, about 1½ miles south-westward of Bullock point. Three rocks lie close off the south-eastern side of Brine island, one, which dries, opposite Tonze rock, and the others, 4 cables north-eastward and 2 cables south-westward, respectively, of the drying rock. A rock lies close off the southern side of the channel opposite the south-western end of the cutting through Brine island. A stone groyne extends about 50 yards (45m7) from the south-western side of the southern part of Brine island.

Tonze rock lies off a spur extending from Single Tree hill, 240 feet (73m1) high, situated about three-quarters of a mile southward.

Jung-ch'i-hsü (Yungki) stands on the southern side of Taileung channel opposite the entrance to Shun tak branch (page 626), about 1¾ miles westward of Brine island. A rock lies close off the northern bank opposite the eastern end of Jung-ch'i-hsü and an overhead telegraph cable crosses the channel about half a mile eastward of the town.

Clown rock, which dries, lies about 3 cables westward of the entrance to Shun tak branch, and a short distance off the southern bank. Clown rock is usually marked by a small buoy.

There are some steps on the northern bank about 6 cables westward of the entrance to Shun tak branch. A rock, with a depth of 10 feet

Charts 2562, 2661a.

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Chart 3588.

(3m0) over it, lies nearly in mid-channel, southward of the steps, and another rock lies close off the southern bank, a short distance farther westward.

The village of Ma-kang (Makong) stands about half a mile north-north-westward of the steps.

A rock, with eddies near it, lies off the southern bank about 1½ miles westward of the above-mentioned steps, and, a short distance farther westward, Taileung channel turns southward for 1½ miles, and then eastward for about half a mile, where it joins the northern end of Yellow reach and the north-western end of Kerr channel; numerous groynes extend from the south-western side of the bend half a mile westward of the junction, and some rocks lie close off the north-eastern bank just northward of the junction where there is also a prominent groyne.

A rock, which dries, and was marked by a buoy, in 1936, lies near mid-channel at the junction of Taileung channel with Yellow reach; vessels should pass south-westward of this rock.

Yellow reach.—At its northern end, Yellow reach is joined from north-westward by Taileung channel, and from south-eastward, by Kerr channel (page 620). At its southern end, it is joined from westward by Junction channel, from south-westward by Junction bend, and from south-eastward by Siulam channel (page 620). Parrots beak (*Lat. 22° 43′ N., Long. 113° 14′ E.*), at the south-eastern end of Yellow reach, is mentioned on page 620.

Junction channel and Junction bend.—Telegraph cable.—These channels connect Yellow reach and the channels running into it with the Hsi chiang at First cliffs (page 538). Junction channel is separated from Junction bend, southward of it, by Namsha, a flat island, and Hoisam sha, an island lying close north-westward of Namsha.

Mahning bar, with a depth of 4 feet (1m2) over its outer edge, extends from the northern side of Junction channel north-north-eastward of Mud point, the north-western extremity of Namsha.

An overhead telegraph cable, indicated on the chart, is carried from the northern side of Junction channel to the southern side of Junction bend, across the south-eastern end of Hoisam sha, about half a mile westward of Mud point.

Forester rock, consisting apparently of three pinnacles, with a depth of 10 feet (3m0) over the westernmost and possibly less over the easternmost, and marked by strong eddies, lies a little on the northern side of mid-channel, about one mile north-westward of Mud point. Vessels should pass between Forester rock and Hoisam sha.

A bank, with depths of from 2 to 6 feet (0m6 to 1m8) over its outer end, extends half a mile north-westward from Hoisam sha. Lowis island, which is low, lies on the north-eastern side of this bank with drying patches in the channel between it and Hoisam sha.

The village of Mahning, in which there is a temple, lies on the north-eastern bank of Junction channel northward of Lowis island; large groynes extend from the northern bank about 4 cables westward of the temple. First cliffs are situated about 2 miles west-north-westward of Mahning.

Junction bend is joined by the northern end of Lung kong creek (page 532) at Simon point, situated 1½ miles south-eastward of the

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Chart 3588.

western extremity of Hoisam sha. Junction bend does not appear to be generally used by steam vessels.

Shun tak branch and Laklau creek.—Telegraph cables.—Shun tak branch leads from Taileung channel, opposite Jung-ch'i-hsü, in a north-westerly direction, past the village of Laklau, into the southern end of Fat shan branch (chart 2734), and thus into San-shui reach (page 565).

Some rocks extend from the north-eastern bank of Shun tak branch about three-quarters of a mile north-north-westward of Jung-ch'i-hsü (page 624). A short distance northward of these rocks, a creek which connects Shun tak branch with Taileung creek (page 624) joins the branch from northward. This creek is divided into two branches about 1¼ miles northward of its southern entrance, the north-western branch, with a barrier close to its southern entrance, leading past the south-western side of the town of Shun-te (Taileung) (page 627).

About half a mile north-westward of the entrance to the above-mentioned creek a shoal extends from the southern side of Shun tak branch, and, about 2½ miles farther south-westward, the village of Chunghok is situated on the northern side of the branch. A shoal extends from the northern bank abreast Chunghok.

The village of Fungkan stands on the southern side of the branch, about 2¼ miles north-westward of Chunghok.

An overhead telegraph cable indicated on the chart, crosses the branch about 2 miles north-westward of Fungkan, and, about 1½ miles farther north-westward, Shun tak branch joins the northern end of Kum chuk creek (page 538). Between this junction and its junction with the south-western end of Brick kiln creek (page 627), about one mile north-north-eastward, Shun tak branch is known as Laklau creek.

The village of Laklau (*Lat. 22° 52′ N., Long. 113° 07′ E.*) stands on both sides of this portion. The creek is deep and unobstructed except for a rock on the northern bank, and a sandbank on the western bank, at its southern entrance, the positions of which can best be seen on the chart.

The entrance to Laklau creek from Kum chuk creek is scarcely noticeable until nearly abreast it; there is a small joss house, with a few small trees, on the eastern entrance point. The creek is narrow, varying from 70 to 40 yards (64^{m}0 to 36^{m}6) in width, and there are four sharp turns in it, which should be navigated with extreme caution, as, besides the intricacy of the channel, there are usually numerous vessels moored on both sides, and others using the channel.

Overhead telegraph cables, indicated on the chart, cross the channel a short distance south-westward, and again about half a mile northward of Laklau.

The current in Laklau creek is nearly always in a northerly direction, and, at low water, runs strongly, rendering the passage dangerous for vessels proceeding in that direction.

An islet, with a shoal extending a short distance from its south-western side, lies close off the northern side of Shun tak branch at its junction with Brick kiln creek. Lung-chiang-hsü (Lungkong), close westward of which is a hill, 590 feet (179^{m}8) high, stands a short distance from the south-western side of Shun tak branch, about 2 miles westward of the islet. Overhead telegraph cables, indicated on the chart, cross the branch northward of Lung-chiang-hsü. Close west-

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Chart 3588.

ward of these cables a drying shoal extends a short distance from the northern bank.

The village of Yungkau, in which are some chimneys, stands on the north-eastern bank about 1¾ miles north-north-westward of Lung-chiang-hsü. A drying shoal extends a short distance from the south-western bank abreast Yungkau, and a small detached drying patch lies a short distance off the same bank close eastward of this shoal. A drying bank lies in mid-channel off the north-western end of Yungkau; vessels should apparently pass between this bank and the north-eastern side of the channel.

Chart 2734.

An islet (*Lat. 22° 56′ N., Long. 113° 03′ E.*) lies in a small bight in the northern bank a short distance westward of Yungkau. From this islet Shun tak branch runs westward for about 1½ miles and north-north-westward for about 3½ miles, where it joins the western end of Kat lee creek (page 629) and the southern end of Fat shan branch.

The village of Leungpo, in which is a chimney, is situated on the north-eastern bank of Shun tak branch, about half a mile south-eastward of its junction with Kat lee creek. An islet lies in mid-channel close southward of Leungpo.

An overhead telegraph cable, indicated on the chart, crosses the channel from the southern end of the last-mentioned island to the southern entrance point of Whan sien creek, which joins Shun tak branch from westward here. Close off the northern end of the same island there is an islet, with a drying bank extending for a short distance northward from it. An islet lies on the edge of a drying bank extending from the south-western side of Shun tak branch, a short distance southward of its junction with Kat lee creek.

Chart 3588.

Taileung creek.—About 2¾ miles north-westward of Bullock point (*Lat. 22° 48′ N., Long. 113° 20′ E.*) (page 622) there is a bar, with a depth of 2 feet (0m6) over it, in Taileung creek, and three barriers extend from the south-western side of the creek at distances of 1½, 2½, and 3 miles, respectively, north-westward of the same point.

The walled town of Shun-te (Taileung) is situated on the south-western side of the creek about 4 miles north-westward of its south-eastern entrance, and the towns of Lun-chiao (Lunkao) and Yang-o (Yeungngak) are situated on the northern side of the creek about 2 and 3 miles, respectively, farther north-westward. Westward of Yang-o there is a bad turn in the creek, and, about 1½ miles north-westward of this turn, Taileung creek joins Brick kiln creek. For the rock close northward of the junction, *see* page 628.

Brick kiln creek.—Telegraph cables.—Brick kiln creek connects Li-ch'i hung, from a position about one mile westward of Tsznai island (page 622), with Shun tak branch, northward of Laklau creek (page 626). The creek is tidal, with a rise of from 4 to 5 feet (1m2 to 1m5), except when the upper rivers are in flood. The current usually flows in an easterly direction.

Overhead telegraph cables cross the creek at distances of 1¾ miles and 3 miles, respectively, westward of the eastern entrance. A short distance farther westward, the village of San-hung-ch'i (Samhungi) is situated on the northern side of Brick kiln creek and on the western

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Chart 3588.

side of a creek leading northward to the town of Pei-chiao (Pakkao), a distance of about one mile.

Close westward of San-hung-ch'i a bank extends a considerable distance from the north-western side of the creek. About 2 miles westward of San-hung-ch'i, Brick kiln creek is joined from south-eastward by Taileung creek (page 627); a rock, with a depth of less than 6 feet (1m8) over it, lies a short distance southward of mid-channel abreast the mouth of Taileung creek.

Huang-lien-hsü (Wonglin) stands a short distance from the southern bank about half a mile westward of the mouth of Taileung creek, and the village of Namhoi stands on the southern bank about half a mile farther westward.

About one mile westward of Namhoi, Brick kiln creek makes a sharp bend and joins Shun tak branch and Laklau creek, about $1\frac{3}{4}$ miles south-south-eastward.

Kum chuk creek.—Rapid.—Telegraph cable.—Kum chuk creek connects Shun tak branch, at its junction with the southern end of Laklau creek, with the Hsi chiang abreast Fa chiau (page 538).

The route via Kum chuk creek, Laklau creek, Brick kiln creek, Chunchune channel (page 634) and Hamilton creek (page 635) is much used by small craft proceeding from the Hsi chiang to Blenheim reach (page 608), or vice versa. It is navigable for vessels up to 170 feet (51m8) in length, with a beam of about 26 feet (7m9) and a draught of 4 feet (1m2). This is the shortest route throughout the year, but sometimes during the summer season vessels cannot steam up the Kum chuk rapid in a westerly direction, and use Junction channel (page 625) instead.

The current in the various channels mentioned above usually runs towards the Chu chiang, but occasionally, in winter, it may run in the opposite direction; this occurs on extra high tides.

The rock and sandbank at the northern end of Kum chuk creek are mentioned on page 626. An overhead telegraph cable indicated on the chart, crosses the creek at a sharp bend about one mile east-south-eastward of the south-western entrance of the creek. The village of Kum chuk (*Lat. 22° 48′ N., Long. 113° 05′ E.*) stands on the northern side of this entrance.

At its junction with the Hsi chiang, a rock lies about 10 yards (9m1) from the stone bunding on the northern bank of Kum chuk creek, and numerous rocks, which are dangerous, extend a short distance from the southern bank. Between these dangers a rapid is formed by the rush of water from the Hsi chiang. In summer, when the Hsi chiang is high and it is low water in the delta, the current in the rapids attains a rate, at times, of about 10 knots; and to stem it a speed of at least 13 knots is necessary, owing to the rise in the water at the head of the rapid, up which the vessel has to be forced. At times the passage is impossible. The course to be steered is practically in mid-stream.

At dead low water with a high tide there is no rapid, and on certain exceptional cases a flow from Kum chuk creek into the Hsi chiang has been observed. At very low tides in the low-river season the rapid runs fairly strongly. With a water level of 4 feet (1m2) or more in the Hsi chiang the ascent of the rapid should not be attempted before half-flood or after half-ebb. With a river level of 10 feet (3m0) or more at Kao-yao (page 542), the rapid runs very strongly at any time, flood-

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Chart 3588.

ing the stone bunding on the northern side of the entrance, and it is doubtful if the ascent could then be made, even at high water. The descent can be made at any time, but the entrance is narrow. The tide is about 5 hours late on Hong Kong in Kum chuk creek.

There is good, though deep, anchorage in the reach eastward of the western entrance to Kum chuk creek, but there is little room for turning.

Charts 3588, 2734.

Kat lee creek.—Telegraph cable.—This creek connects Li-ch'i hung with the northern end of Shun tak branch (page 626). At half-tide, with a depth of 10 feet (3m0) on the tide-gauge at San-shui (page 566), a least depth of 5 feet (1m5) was found, in 1936, in Kat lee creek over the bar opposite Lok cheung.

The eastern entrance (page 623) is between the rocks extending from the southern bank opposite the western end of Lanshek (*Lat. 22° 59′ N., Long. 113° 06′ E.*) and a sunken rock, usually marked by swirls, a short distance north-westward. A bank extends southward from the islet, on the north-western side of the entrance. There are three bars in the creek, with depths of 2 feet (0m6) over them. It is reported that the channels change continually.

An overhead telegraph cable indicated on the chart, crosses the creek about 2½ miles westward of the eastern entrance. At low river, in October, 1935, H.M.S. *Robin* found a staked channel running diagonally across the creek between the shoals, the positions of which can best be seen on the chart, lying eastward of the telegraph cable.

The village of Kat lee stands on the southern bank, about one mile eastward of the western entrance. There are some obstructions off the southern bank at the eastern end of the village.

A bank extends from the southern side of Kat lee creek at its junction with Shun tak branch, and a spit extends from the north-eastern bank at its junction with Fat shan branch.

Chart 2734.

Fat shan branch.—Beacons.—This branch connects the northern end of Shun tak branch (page 626) and the western ends of Kat lee creek and Li-ch'i hung (page 621) with the south-eastern end of San-shui reach (page 565) and is a continuation of Pei chiang. Fat shan branch is the westernmost of a number of channels which form the shortest route between Canton and San-shui.

An island lies on the eastern side of the fairway of Fat shan branch about three-quarters of a mile northward of its junction with Kat lee creek, and a drying bank extends from the western shore, a short distance farther northward.

Li-ch'i hung joins Fat shan branch from eastward about 1½ miles northward of the last-mentioned island. A patch of foul ground is reported to lie nearly in mid-stream close north-westward of this junction.

An island lies in mid-channel about 1½ miles northward of the entrance to Li-ch'i hung, with a drying patch lying between the southern end of the island and the eastern bank. The village of Shui kong stands on the eastern side of Fat shan branch about one mile northward of the last-mentioned island. There is a rest house on the eastern bank about half a mile southward of Shui kong. Abreast the rest house, an island lies off the western bank ; a shoal, which dries 9 feet

Charts 2562, 2661a.

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Chart 2734.

(2m7) extends from the eastern side of this island. A bar, with depths of from 4 to 7 feet (1m2 to 2m1) over it, was reported, in October, 1935, to lie off Shui kong. About 1½ miles north-north-westward of Shui kong there are some red cliffs on the eastern bank, off which some rocks, which dry 3 feet (0m9), extend a short distance; a bank extends from the south-western shore opposite the red cliffs.

About 4½ miles north-westward of the above-mentioned red cliffs, Fat shan branch joins the south-eastern end of San-shui reach (page 567). Banks extend from both sides in this portion of Fat shan branch, the positions and extent of which can best be seen on the chart.

A beacon stands in mid-stream about half a mile north-westward of the red cliffs, and another beacon (*Lat. 23° 09′ N., Long. 112° 55′ E.*) marks the southern side of a bank extending from the north-eastern shore, about 3 miles farther north-westward. Two small shoals, nearly awash with one foot (0m3) on the tide-gauge at San-shui, were reported off the southern bank, in October, 1935, about midway between these two beacons; there was deep water close to the southern bank.

From the above-mentioned red cliffs to the north-western end of Fat shan branch, telegraph posts follow the Canton-San-shui railway line at varying distances along the north-eastern bank.

Chart 3588.

Chiu mun.—This channel, entered between Black point (*Lat. 22° 45′ N., Long. 113° 34′ E.*) (page 596) and a point about 7 cables south-westward, connects the north-western end of Lankit entrance (page 595) with the south-eastern end of Tai kok tau channel, Barrier passage, and Mount channel. South Centre junction enters Chiu mun from westward a short distance north-westward of its entrance and, about 1½ miles farther north-westward, North Centre junction enters from westward. A spit, with a depth of 2 feet (0m6) at its outer extremity, extends three-quarters of a mile in a south-easterly direction from the northern entrance point of South Centre junction and a spit, with depths of from 5 to 6 feet (1m5 to 1m8) over it, extends the same distance in the same direction from the northern entrance point of North Centre junction.

Wilder passage, which connects Chiu mun with Gutzlaff channel (page 631), enters the northern side of Chiu mun about 3¼ miles north-westward of Black point. Wilder passage is blocked at a sharp bend by fishing stakes, and is impassable.

About 2½ miles north-westward of the entrance to Wilder passage, Chiu mun is joined from northward by Mount channel (page 631) and from north-westward by Barrier passage, and Tai kok tau channel. A rock, with a depth of less than 6 feet (1m8) over it, lies on the north-eastern side of Chiu mun, in the middle of the entrance to Mount channel.

South Centre junction.—This junction connects Chiu mun with Li-ch'i hung. Its eastern entrance is described above and its western entrance on page 622. H.M.S. *Seamew* proceeded through South Centre junction in 1932, and found depths, in mid-channel, of not less than 20 feet (6m1); a least depth of 2¼ fathoms (4m1) was reported in 1936.

North Centre junction.—Telegraph cable.—This junction con-

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Chart 3588.

nects the same two channels. Entering from eastward, vessels should give a wide berth to the spit extending from the northern entrance point.

An islet lies off the southern bank about one mile westward of the eastern entrance, and two creeks join the junction from north-westward about 1¼ miles farther westward. A shoal was reported, in 1927, to extend from the southern bank of North Centre junction into mid-channel, about half way between its eastern and western entrances.

An overhead telegraph cable, indicated on the chart, crosses the junction about 3 cables north-eastward of its south-western entrance.

Tai kok tau channel.—This channel connects Lankit entrance (page 595), through Chiu mun, with Saiwan channel (page 632). McCleverty channel, described below, enters Tai kok tau channel from north-westward, about 3 miles north-westward of the junction of the latter with Chiu mun; fishing stakes may be in position off the north-eastern bank of this portion of the channel, during the low-river season.

The north-western end of Barrier passage, described below, joins Tai kok tau channel from south-eastward about 1¾ miles northward of the south-eastern entrance of McCleverty channel; there is shoal water in this portion of Tai kok tau channel and two prominent groynes extend from the north-eastern bank.

At its north-western end, where it enters Saiwan channel, Tai kok tau channel is divided into two branches by an island; the south-western of the two branches should be used.

Barrier passage.—Barrier passage (*Lat. 22° 49′ N., Long. 113° 26′ E.*) connects the north-western end of Chiu mun with Tai kok tau channel, about 4 miles north-westward. Spits extend from both the south-eastern entrance points, and an islet lies close off the south-western bank of the passage, a short distance north-westward of this entrance.

There are stone barriers about half-way through and at the north-western end of the passage.

McCleverty channel.—The south-eastern entrance of McCleverty channel is described above; its north-western entrance is situated at the western end of Saiwan channel, close eastward of the junction of that channel with Li-ch'i hung (page 621).

Mount channel.—This channel connects the north-western end of Chiu mun, with Saiwan channel about 7 miles north-westward. The rock in the southern entrance of Mount channel is mentioned on page 630.

Mount Samfu, 295 feet (89m9) high, lies on the south-eastern side of Mount channel, about 3 miles northward of its southern entrance.

Mount channel is not used by H.M. Gunboats.

Chart 1740.

Gutzlaff channel.—This channel connects the Chu chiang with the south-eastern end of Saiwan channel. About 7 cables west-north-westward of Ta-hu shan (page 600), an extensive shoal, which dries 4 feet (1m2), with an embankment near its eastern end, occupies the middle of Gutzlaff channel. The northern end of Wilder passage (page 630) enters Gutzlaff channel about 2 miles westward of Ta-hu shan. An embankment extends in a north-easterly direction from the south-western side of Gutzlaff channel about one mile north-westward

Charts 2562, 3026, 2661a, 2661b.

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Chart 1740.

of the northern end of Gifu island; abreast this embankment the northern end of Gutzlaff channel is divided by a drying bank, on which are some islands, the positions and extent of which can best be seen on the chart.

The channel between Gifu island and Shatsai island is mentioned on page 601; a drying bank extends from the north-western end of Gifu island between this channel and the north-eastern branch of Gutzlaff channel.

Hill passage.—This passage runs almost parallel with the Chu chiang, westward of Ta sha and Hai hsin sha (page 601). It is navigable by vessels with a draught of about 9 feet (2m7), and enables vessels to avoid the main traffic in the Chu chiang, and possibly to cheat the tide. It can also be used by vessels proceeding from Canton, by Belcher reach, to Saiwan channel and to the various channels which are connected with the western end of that channel. The banks of Hill passage have been considerably reclaimed.

At its northern end, Hill passage is entered between Moth point (*Lat. 22° 59′ N., Long. 113° 31′ E.*) (page 602) and a point about half a mile westward. Just northward of the entrance, a bank, a considerable portion of which dries from one to 5 feet (0m3 to 1m5), extends about half a mile from the western side of the passage, leaving a channel, about one cable wide, in the fairway of which there is a depth of 11 feet (3m4), between the outer edge of a spit which extends about 3 cables northward from Moth point. About one mile southward of the entrance, fishing stakes extend almost completely across the passage.

It was reported, in 1936, that there was then a better channel along the western bank of Hill passage, past Moth point, than indicated by the chart.

Si chi tau, on which is a small pagoda, stands a short distance from the western bank, about 1½ miles south-south-westward of Moth point. The mouth of Kong mei hou, leading to the town of Kautong, about 3½ miles northward, is situated on the western side of Hill passage about three-quarters of a mile southward of Si chi tau.

A bank, with depths of less than 3 fathoms (5m5) over it, extends from the western sides of Hai hsin sha and Ta sha in that part of Hill passage which lies between the mouth of Kong mei hou and Forbes point, on the western side, about 3¾ miles southward.

Southward of Forbes point, Hill passage is joined from north-westward by Saiwan channel. A spit, part of which dries, and at the extremity of which there is a depth of 6 feet (1m8), extends 3½ cables south-eastward from Forbes point.

The south-eastern end of Hill passage is described on page 601.

Saiwan channel.—Light.—Beacons.—Saiwan channel connects Hill passage with Li-ch'i hung, at the southern end of Tsznai island (page 622). The tidal streams in Saiwan channel are strong, with swirls.

The channel is entered between Forbes point and a point about 4 cables south-westward. Some fishing stakes extend half way across the channel from the southern bank, about 1½ miles west-north-westward of Forbes point.

Chart 3588.

About 3½ miles west-north-westward of Forbes point, a submerged barrier, consisting of stones and stakes, named Saiwan barrier, extends

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Chart 3588.

from the southern bank of the channel, leaving a channel, about 60 yards (54m9) wide, between its extremity and the northern bank, where there is a white hut in some trees.

A light is exhibited, at an elevation of 15 feet (4m6), from a white iron column near the hut.

A pair of leading beacons stands about 1½ cables eastward and westward of the light-column; the front beacon of each pair consists of a white post, surmounted by a triangle, point up; the rear beacons of each pair are similar, but surmounted by a triangle, point down; in line, the beacons lead through the channel between the light-column and the barrier from westward or eastward.

The northern bank is faced with stone for a short distance on each side of the hut. Westward of the barrier there is a groyne which is often submerged.

A short distance eastward of Saiwan barrier (*Lat. 22° 55′ N., Long. 113° 27′ E.*), the channel is joined from north-westward by a creek which connects it with Fu lu kong creek (page 636).

Some fishing stakes extend from the southern bank about one mile westward of Saiwan barrier; about one mile farther westward, there is a swirl off the southern bank which should be avoided.

Mount channel (page 631) enters Saiwan channel from south-eastward about 3 miles westward of Saiwan barrier, and, about 2 miles farther westward, a rock, with a depth of less than 6 feet (1m8) over it, lies a little southward of mid-channel. This rock is the chief danger in Saiwan channel, and vessels should pass between it and the northern bank, where there is a depth of 7 feet (2m1).

A short distance westward of the above-mentioned rock, Saiwan channel is joined from south-eastward by the two mouths of Tai kok tau channel (page 631); a rock, the existence of which is doubtful, is charted close off the south-eastern bank of Saiwan channel, about half a mile south-westward of the south-western of these two mouths. About one mile farther south-westward, there is a mound on the southern bank, abreast which, a rock, with a depth of 7 feet (2m1) over it, lies about 30 yards (27m4) off the southern bank.

Hoi cheuk passage (page 634) enters Saiwan channel from west-north-westward opposite the above-mentioned mound, and, about 1½ miles farther westward, Saiwan channel enters Li-ch'i hung (page 621). In this portion of Saiwan channel, there are numerous groynes extending from both banks. McCleverty channel (page 631) enters Saiwan channel from south-eastward a short distance eastward of its junction with Li-ch'i hung; some rocks extend in a westerly direction from the eastern entrance point of McCleverty channel.

The town of Sha-wan (Saiwan), which can be distinguished by its pagodas, stands a short distance inland from the northern bank about three-quarters of a mile north-eastward of the mouth of Hoi cheuk passage.

Channels between Li-ch'i hung and Nanho tao.—Several channels connect Li-ch'i hung with Nanho tao below Canton. The most important of these are Chunchune channel, which leads from the western end of Tsznai island, through Hamilton creek, into Nanho tao a short distance south-eastward of Ta-shih barrier (page 610); Moneypenny creek, which leads from a point close westward of the town of Tangchau into Fatshan branch, eastward of the town of

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Chart 3588.

Nan-hai (Fatshan); and Fatshan branch, which enters Nanho tao at Tai-mei point (page 610).

Hoi cheuk passage.—Telegraph cable.—Hoi cheuk passage connects Saiwan channel with the southern end of Chunchune channel, about 2½ miles west-north-westward of its south-eastern entrance. It runs along the north-eastern side of Tsznai island and is used by small vessels proceeding from the Hsi chiang to Canton.

About a quarter of a mile within its south-eastern entrance, Hoi cheuk passage is obstructed by rocks, which extend from the northern shore more than half way across the channel.

An overhead telegraph cable, indicated on the chart, crosses the passage about 1¾ miles from the south-eastern entrance.

Chunchune channel.—Telegraph cable.—The southern end of Chunchune channel is connected with Li-ch'i hung by a short narrow channel (page 622), passing round the north-western end of Tsznai island (*Lat. 22° 54′ N., Long. 113° 18′ E.*). This channel is generally full of small craft and there is a sharp bend in it, about midway between the two entrances. There are rocks, close inshore, on both sides of the southern entrance. About 2 cables northward of the southern entrance, some foul ground, over which there is a depth of 2 feet (0m6), extends from the north-eastern bank nearly into mid-channel. A rock, which dries one foot (0m3), lies close to the northern bank near the eastern end of the connecting channel, and a spit, with an above-water rock near its eastern end, extends from the northern entrance point at this end, which should be given a wide berth when hauling round into Chunchune channel. Sign boards to go slow are placed at each entrance.

A shoal extends from the eastern bank of Chunchune channel, a short distance within the southern entrance. About three-quarters of a mile northward of the southern entrance, an island, covered at very high water, lies close off the western bank; a watch tower, with a stone wharf near it and a notice board close northward, stands on the eastern bank, about 4 cables northward of this island.

The village of Pingpou, with a hillock close northward, stands on the western bank abreast the watch tower. A bank extends from the western side of the channel abreast Pingpou and there is a rock, close inshore, under the hillock. About a quarter of a mile northward of the watch tower, Fu lu kong creek (page 633) joins Chunchune channel from north-eastward. There is a shoal at this junction which is liable to shift, or disappear; it normally forms a middle ground, and, when prominent, is staked. The channel in this vicinity is shallow.

Close northward of the above-mentioned junction, an island lies close off the eastern bank. A small stone pier extends from the western bank abreast the northern end of the island, and there is a mound on the eastern bank just northward of the island.

The town of Pi-chiang (Pikkong) is situated near the western bank abreast the mound. An overhead telegraph cable, indicated on the chart, crosses the channel at Pi-chiang.

A short distance northward of Pi-chiang, Chunchune channel is joined by two creeks from westward, and by Hamilton creek, from northward. The two above-mentioned creeks pass on either side of the town of Ch'en-t'sun-hsü (Chanchuen) (page 622) and connect Chunchune channel with Li-ch'i hung. Chunchune channel is tidal.

Charts 2562, 2661a.

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Chart 3588.

Hamilton creek.—Beacon.—The entrance to Hamilton creek, mentioned above, is very narrow and a watch must be kept for the effects of the tidal stream when entering. There is a beacon (*Lat. 22° 58′ N., Long. 113° 16′ E.*) on the eastern side, close off which there is a rock, and a shoal extends from the western side of the entrance.

Close above the entrance the creek bends sharply north-westward, where a spit extends from the eastern bank. About one mile beyond the bend, a jetty extends from the south-western bank, which is steep-to with foul ground close inshore.

The town of Weichung, off which there is a stone pier, is situated on the eastern side of the creek abreast the above-mentioned jetty. A bank of shingle extends from the north-eastern side between the stone pier and a point nearly three-quarters of a mile south-eastward. A guard house stands on the western bank about 1¼ miles northward of the jetty. Northward of the guard house, the depths in the creek become greater.

The north-western entrance of Fu lu kong creek is situated on the eastern side, a short distance northward of the guard house. A ruined fort stands on a hill about one mile north-westward of the mouth of Fu lu kong creek. There is a village on the western bank below the fort and some rocks lie close offshore abreast the village. The mouth of a creek, connecting Hamilton creek with Moneypenny creek, is situated on the western side, about 4 cables northward of the ruined fort. A wooden pier extends from the south-eastern bank opposite the mouth of this creek. Smith's mound, on which is a tower, stands a short distance inland from the south-eastern bank, about one mile north-eastward of the mouth of the above-mentioned creek. In this portion of the channel, two rocks lie close off the north-western bank, and two off the south-eastern bank, the positions of which can best be seen on the chart.

Chart 1739.

In the vicinity of Smith's mound there is a rocky patch, silted over with sand, over which there is a depth of one foot (0m3), in mid-channel, leaving a passage on either side; the south-eastern is the deeper and better of these passages, but the north-western might be useful if necessary to pass traffic. A lamp pole (*Lat. 23° 02′ N., Long. 113° 16′ E.*) stands on the eastern bank about half a mile north-eastward of Smith's mound. The south-eastern end of Macao creek (page 636), which connects Hamilton creek with Fatshan branch, is situated opposite the lamp pole.

From the south-eastern end of Macao creek to Clarke point (page 610), where it enters Nanho tao, Hamilton creek is wide and unobstructed, except for some fishing stakes off a village near the entrance.

Chart 3588.

Tides.—Tidal streams.—The flood tidal stream enters the southern end of Chunchune channel and the northern end of Hamilton creek at the same time.

The range of tide at Weichung is about 4 feet (1m2) and is less northward of that place. There is no tidal stream at Weichung during the low-river season. The times of high and low water are about 6 hours after those of Hong Kong.

Charts 2562, 2661a.

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Chart 3588.

In the flood season, the rise of the various rivers all affect the water in these two creeks in varying degrees. When there is a big rise, the tidal effect becomes negligible and the current flows continually through these creeks in the direction of the lowest water, usually in a northerly direction. Under these conditions, the banks at the northern end of Hamilton creek may be flooded.

Fu lu kong creek.—This creek passes eastward of Weichung. About one mile north-north-eastward of its southern entrance (page 634), Fu lu kong creek is joined from south-eastward by a creek which connects it with Saiwan channel close eastward of Saiwan barrier (page 633).

The least depth in Fu lu kong creek was reported, in 1926, to be about 3 feet (0m9), but it is subject to change. The creek is used by tows when the depths in Chunchune channel is insufficient.

Chart 1739.

Macao creek.—Vessels proceeding to Canton by Macao creek, from its junction with Hamilton creek, will shorten the distance by about half a mile and also avoid the strong ebb tidal stream in Nanho tao between Clarke point and Tai-mei point.

Sandbanks extend from both entrance points of the south-eastern end of Macao creek. The creek runs in a north-westerly direction, with several bends, for a distance of about 1½ miles where it enters Fatshan branch (page 637). Rogers point lies on the eastern side of the northern entrance. A spit extends about three-quarters of a cable from the north-western entrance point. About half a mile southward of the northern entrance, a shallow creek, also connected with Hamilton creek, joins Macao creek from southward.

Chart 3588.

Moneypenny creek.—Telegraph cable.—Moneypenny creek connects Li-ch'i hung, from a point about 4 cables westward of Tangchow (*Lat. 22° 58′ N., Long. 113° 09′ E.*), with Fatshan branch, about 6 miles north-eastward. The least depth in the creek was reported, in 1936, to be 10 feet (3m0).

A sandbank extends from the south-eastern entrance point; between this entrance and a sharp bend, about 2 miles east-north-eastward, several groynes extend from both banks, the positions of which can best be seen on the chart; two groynes extending from the eastern bank at the sharp bend are dangerous. About 6 cables farther northward there is another sharp bend, where a small spit extends from the western bank. About 1¼ miles north-north-eastward of this bend, a creek leading to the town of Nan-hai (Fatshan), about 2 miles westward, enters the western side of Moneypenny creek; an overhead telegraph cable, indicated on the chart, crosses Moneypenny creek close eastward of the mouth of this creek.

About half a mile north-eastward of the telegraph cable, Moneypenny creek turns in a south-easterly direction for a short distance. There is a rocky patch off the southern bank of this bend, and some rocks lie off a ruined joss house on the north-eastern bank. The village of Ng tao is situated on the northern bank about one mile eastward of the ruined joss house. About three-quarters of a mile north-eastward of Ng tao, Moneypenny creek is joined from south-eastward by a creek connecting it with Hamilton creek. A spit extends from the western bank opposite the mouth of this creek.

Charts 2562, 2661a.

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Chart 1739.

The town of Pingchau stands on the western side of Moneypenny creek about half a mile northward of Ng tao. Abreast Pingchau the creek trends sharply northward for about three-quarters of a mile, where it joins Fatshan branch. Spits extend from both the northern entrance points.

Charts 2562, 1739.

Fatshan channel.—The south-western end of Fatshan channel (*Lat. 23° 02′ N., Long. 113° 02′ E.*) is situated on the northern side of Li-ch'i hung, about 2 miles eastward of the junction of that channel with Fat shan branch (page 629). The channel leads in a northerly and easterly direction through the town of Nan-hai (page 636) where it is joined by the creek from Moneypenny creek. At this junction it is also joined by a creek leading in a northerly direction for about 1½ miles and an easterly direction for about 3 miles, where it is connected with the north-western end of Fatshan branch and the south-western end of Fatshan creek (*see* below) at Keppel junction.

Fatshan branch.—The eastern end of Fatshan branch, from its junction with Moneypenny creek, about 3 miles south-eastward of Keppel junction, forms the direct channel between Canton and San-shui (page 567), passing through Moneypenny creek, Li-ch'i hung, Fat shan branch and San-shui reach ; it is reported to be unnavigable by vessels drawing more than 4 feet (1m2). In summer these channels can be used without difficulty, but not too late in the year, when any case of grounding might entail the chance of remaining throughout the winter.

Hyacinth island lies in the middle of Fatshan branch midway between the northern ends of Moneypenny and Macao creeks. The channel northward of the island should be used ; at the western end of this channel there is a bar, reported to have a depth of 4 feet (1m2) over it, in 1934. The channel southward of the island is obstructed by a rock at its eastern end, but is used by launches.

Chart 1739.

Near the eastern end of Hyacinth island, Fatshan branch is joined by Huati chi (*see* below) from northward. A bank extends from Warren point, the eastern entrance point of Huati chi, and there is a groyne on Hyacinth island opposite the point.

The southern mouth of Collinson creek, which connects Fatshan branch with Nanho tao in the vicinity of Macao fort (page 610), is situated about three-quarters of a mile eastward of Warren point. A bank extends eastward from the western entrance point of Collinson creek.

A rock lies about 2 cables north-eastward of Rogers point (page 636) and a short distance off the south-eastern bank of Fatshan branch ; another rock lies close to the northern bank, about 3 cables farther north-eastward.

Fatshan branch enters Nanho tao at Tai-mei point, about one mile east-north-eastward of the southern end of Collinson creek. Fish stakes extend from the northern bank about half way across the channel, half a mile westward of Tai-mei point.

Huati chi.—Huati chi or Fati creek connects Fatshan branch, northward of Hyacinth island, with Hsi ho tao, the western part of Canton harbour. An island lies in the middle of the creek about 1½ miles north-north-westward of its southern entrance, and, about

Charts 3588, 2661a, 2661b.

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Chart 1739.

1¼ miles farther northward, Fatshan creek joins Huati chi from westward.

Fatshan creek connects Huati chi with Fatshan branch at Keppel junction (page 637).

At its northern end, Huati chi passes through the extensive suburb of Fati. For the northern entrance of the creek, *see* page 612.

Charts 2734, 2562.

CHANNELS BETWEEN THE PEI CHIANG AND CANTON.

—Pai-ni chiang.—Telegraph cable.—Pai-ni chiang (Lupa creek) is the principal channel between the Pei chiang and Canton harbour. Its western entrance is situated close southward of the town of Lupao (*Lat. 23° 23′ N., Long. 112° 54′ E.*) (page 569).

About one mile eastward of its western entrance, two islets lie close off the northern bank, and an overhead telegraph cable, indicated on the chart, crosses the creek close eastward of the islets. About 3 miles farther eastward, Pai-ni chiang is joined from north-eastward by Paknai channel, which, passing the town of Paknai, about 4 miles north-eastward of its entrance, runs about 12 miles south-eastward and rejoins Pai-ni chiang.

Charts 2734, 2562, 1739.

From its junction with the northern end of Paknai channel, Pai-ni chiang runs in a south-south-easterly direction, with several sharp bends, for about 15 miles, where it is joined from west-south-westward by Hsi-nan creek, the south-western entrance of which is mentioned on page 566. At this junction, Pai-ni chiang turns east-north-eastward. A Buddhist monastery is situated on the southern bank of the creek, about 2¾ miles east-north-eastward of the junction. An islet lies in the middle of the creek about half a mile eastward of the monastery. The village of Kum kai hue stands on the north-western bank of Pai-ni chiang, about 3½ miles east-north-eastward of the Buddhist monastery. Here the creek trends south-eastward for 2½ miles, where it is joined by the southern end of Paknai channel.

About 2 miles farther south-south-eastward, Pai-ni chiang is divided into two branches, the western of which joins the western end of Encounter reach (page 613); the eastern branch is again divided at its southern end into two branches, by Belcher island (page 613); the western of these branches joins the eastern end of Encounter reach, and the eastern branch joins the northern end of Nemesis reach (page 613).

Chart 1262.

TUNG CHIANG.—The Tung chiang, or East river, rises in the Kiuling shan in the province of Kiangsi, then flowing southward to the border of the province of Kwantung, from which it runs south-south-westward to Heng-li-hsü (Waichow), where it trends westward to Shih-lung (Sheklung) (*Lat. 23° 07′ N., Long. 113° 50′ E.*). Westward and south-westward of Shih-lung a delta is formed, through which numerous channels flow into the Chu chiang between Chuen pi island (page 593) and T'ung-ku sha (page 603), about 20 miles north-north-westward.

The Tung chiang has a total length of about 250 miles, and is, generally, a broad, shallow stream, much obstructed by banks, and with a

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Chart 1262.

strong current. The least depth in the river to Shih-lung is about 2 feet (0m6). Launches, with a draught of from 3½ to 4 feet (1m1 to 1m2), ply from Shih-lung to Heng-li-hsü at all seasons, and to Hoyun, 78 miles above Heng-li-hsü in the summer. Light junks regularly reach Lungchun, and it is reported that they can reach Hopinghsien in lat. 24° 25′ N., long. 115° 05′ E.

In May, 1919, H.M.S. *Robin* proceeded to Hoyun, and reported strong currents up to a rate of 6 knots. During high river, a vessel 70 feet (21m3) long, 12 feet (3m7) beam, and with a draught of not more than 2 feet (0m6), could probably reach Laolung, 40 miles above Hoyun, but a speed of 12 knots would be desirable.

Chart 1740.

Delta.—Sawshi channel.—Telegraph cable.—The entrance to Sawshi channel, one of the principal channels leading from the Chu chiang to Shih-lung, is described on page 601. There is a bar, with a depth of less than 2 fathoms (3m7) over it, across the entrance.

Close within the entrance, Sawshi channel is joined from south-eastward by Tauling East passage. Sawshi hill, 255 feet (77m7) high, is situated near the southern end of Staunton island, on the south-eastern side of Sawshi channel. Junction creek (page 640) and another creek, close eastward, are entered on the north-western side of Sawshi channel between the southern extremity of Tsamchow, or Delta island, situated about 1¾ miles north-eastward of Blake point, and a point on Naichow, about 4 cables south-westward. Low island lies on the north-western side of the channel, close eastward of Tsamchow. An islet lies between the southern end of Low island and Tsamchow.

On the south-eastern side of Sawshi channel, Yeungkung chau lies north-eastward of Staunton island with a narrow channel between, which is connected, through several unnamed creeks, with Junk creek (page 599) and Anunghoy creek. About three-quarters of a mile north-eastward of the southern extremity of Low island, Sawshi channel is divided into two branches by Hoktinkao, an island, the main branch passing westward and northward of the island, and Ai kong creek, the south-eastern branch, passing south-eastward of the island and rejoining the main channel at Tung-kuan (Tungkunhsien) (chart 2562).

A creek, connected with other creeks in the delta, enters the north-western side of the main channel between Low island and the southern extremity of an unnamed island about 1½ cables eastward; an islet lies close off the mouth of this creek.

On the south-eastern side of Sawshi channel, a drying bank extends about one cable from the north-western side of Yeungkung chau, just below the entrance to Ai kong creek, and a spit, on the northern edge of which is an islet, extends nearly 1½ cables from the south-western extremity of Hoktinkao.

About three-quarters of a mile north-eastward of the southern extremity of Hoktinkao, a drying shoal, on which are three groynes, extends a short distance from the north-western bank.

Chart 3588.

The village of Tao-chiao (Towkao) (*Lat. 23° 00′ N., Long. 113° 39′ E.*) stands on the north-western side of Sawshi channel, about one mile north-north-eastward of the north-eastern extremity of Hoktinkao.

Charts 3588, 2562, 2661a, 2661b, 1263.

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Chart 3588.

A short distance southward of Tao-chiao there is a bar, with a depth of 2 feet (0m6) over it.

Chart 2562.

Tung-kuan, a large walled town, is situated on both banks of Sawshi channel, about 5 miles north-eastward of Tao-chiao. There is a post office and mission hospital in Tung-kuan and frequent communication is maintained by steam launches with Canton and Hu-men-chai (page 599).

At Tung-kuan, Sawshi channel is joined from south-westward by Ai kong creek, and, from westward, by other creeks in the delta.

The village of Shih-chieh (Shekkit) stands on the north-western side of Sawshi channel, about 3½ miles north-eastward of Tung-kuan; there is a depth of only 2 feet (0m6) in places in this portion of the channel, with many sandbanks. A creek, connected with other creeks in the delta, enters the channel from westward midway between Tung-kuan and Shih-chieh. An overhead telegraph cable, indicated on the chart, crosses the channel about one mile south-westward of Shih-chieh. On the south-eastern bank, opposite Shih-chieh, there is a prominent pagoda, standing on a hill. About 3½ miles east-north-eastward of Shih-chieh, Sawshi channel joins the main channel of Tung chiang at Shih-lung, page 638.

The Canton-Kowloon railway crosses Sawshi channel just below Shih-lung (*Lat. 23° 07′ N., Long. 113° 50′ E.*).

Chart 1740.

Junction creek.—This creek connects Sawshi channel, from a short distance within its south-western entrance, with Second Bar creek (*see* below). About 2½ miles northward of its southern entrance, two islets lie on the western side of Junction creek; a short distance southward of these islets, and again about half a mile northward of them, Junction creek is connected by other creeks with Second Bar creek. About one mile northward of the last-mentioned islets there is a rocky shoal and a drying sandbank; the channel, in the fairway of which there is a depth of 4 feet (1m2), lies between these dangers and the eastern bank.

About 2 miles farther northward, Junction creek enters Second Bar creek.

Charts 1740, 3588.

Second Bar creek.—This creek connects the Chu chiang with the Tung chiang a short distance north-eastward of the village of Ch'a-chiao (Chakao), situated on the western bank of Second Bar creek, about 8½ miles north-north-eastward of its entrance (page 602). The navigation of Second Bar creek presents no difficulty for small vessels, but there is a shallow bar off the islands situated about 3½ miles north-eastward of the entrance, at the northern end of Junction creek.

About one mile farther northward, Second Bar creek is joined from north-eastward by other creeks of the delta, which rejoin it about 3 miles farther north-eastward. Here Second Bar creek turns sharply northward and north-eastward for about 1½ miles, where it joins the Tung chiang. There is a rocky patch in mid-channel just northward of the sharp bend and a shoal extends a short distance from the eastern bank a little farther northward; the channel here lies close to the western bank.

Charts 2661a, 2661b.

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Charts 1742, 3588.

Tseki creek.—From its western entrance (page 603) Tseki creek runs in an easterly direction for about 2¼ miles, and then north-north-eastward for about 3 miles, where it enters the Tung chiang ; the town of Ma-yung (Machung) (*Lat. 23° 03′ N., Long. 113° 34′ E.*) is situated on the western bank of Tseki creek a short distance northward of the point where the creek turns north-north-eastward.

Escape creek.—This is the principal entrance of the Tung chiang. About three-quarters of a mile north-eastward of the south-western entrance of Escape creek (page 603), a shoal, which is awash when there is a depth of 10 feet (3m0) on the Belcher reach tide-gauge, lies in mid-channel ; vessels should pass between this shoal and the north-western bank. About one mile northward of this shoal, Escape creek joins the Tung chiang and is joined from westward by Junk passage ; at this junction there are some rocky hills faced by cliffs.

Junk passage.—This passage, in which there is a depth of about 2 feet (0m6), connects the Chu chiang, from abreast T'ung-ku sha with the Tung chiang at the northern end of Escape creek, about 2½ miles eastward of the western entrance of the passage (page 603).

A bank, on which is a patch which dries, extends from the western mouth of Junk passage half way across to T'ung-ku sha, and a rock, covered at high water, lies in mid-channel near the eastern end of the passage, situated at the foot of some low cliffs on the northern bank. There is shoal water off this entrance.

The paddy fields on both sides of Junk passage cover at high water, rendering the channel difficult to distinguish, but it is much frequented by steam launches.

Chart 3588.

Main channel of the Tung chiang.—Telegraph cable.—Between the northern end of Escape creek and Shih-lung (chart 2562), about 23 miles eastward, the Tung chiang is shallow, and is encumbered by many islands and sandbanks, but few rocks. The surrounding country is flat and cultivated, with several large villages.

A pagoda stands on the northern bank at the mouth of a creek about half a mile north-eastward of the eastern end of Junk passage. The village of Lamgoa stands on the northern bank about 4 cables eastward of the pagoda. Abreast Lamgoa, a drying bank, which should be passed on its northern side, lies in mid-channel. A watch tower stands on the northern bank about one mile eastward of Lamgoa. From abreast the eastern end of Lamgoa to the northern mouth of Tseki creek about 1¼ miles eastward, banks extend from the southern side of the river, the extent of which can best be seen on the chart.

Some rocks lie close off the northern bank, about 4 cables east-north-eastward of the above-mentioned watch tower, and a bank extends from a bight in the northern side farther north-eastward.

The village of Hsin-t'ang (Santong) is situated on the northern bank about 2 miles east-north-eastward of the watch tower.

North-eastward of the northern mouth of Tseki creek, groynes extend from the south-eastern bank of the river, and, abreast Hsin-t'ang an extensive bank extends from the same side ; at the western end of this bank there is a rock, and close eastward of the bank is the northern mouth of Second Bar creek. There are rocks a short distance off the northern bank just eastward of Hsin-t'ang.

About 1¼ miles eastward of Hsin-t'ang some brick kilns are situated

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Chart 3588.

on the northern bank. Abreast the brick kilns, a sandbank extends from an island on the south-eastern side of the river.

The village of Ti tong stands on the north-western side of the river about one mile east-north-eastward of the brick kilns.

Chart 2562.

At Ti tong the river divides into several branches. The southernmost branch rejoins the main stream about one mile south-eastward of Hsien-ts'un-hsü (Sintsun), mentioned below, and has not been investigated.

A creek joins the river from northward close eastward of Ti tong, and, about 6 cables north-north-eastward of the mouth of this creek, there is an island with the village of Shako (*Lat. 23° 08′ N., Long. 113° 41′ E.*) situated on its south-eastern side. The main channel passes southward and eastward of this island, and, a short distance farther north-eastward, passes southward and eastward of another island.

The village of Hsien-ts'un-hsü stands on the northern bank about 2 miles north-eastward of Shako. Here the river turns sharply south-eastward, and about one mile above the village is joined by the southern branch from Ti tong.

About one mile south-eastward of this junction is the mouth of a creek leading to the town of Shih-t'an (Shektan), about 2½ miles north-eastward. A watch tower stands on the northern bank, close eastward of the mouth of this creek. Abreast the watch tower the river is joined from south-westward by a creek, connected with other creeks in the delta. Three groynes, with a rock close eastward of them, extend from the southern bank about 1¼ miles eastward of the mouth of this creek.

An island, on which is a leper hospital and a conspicuous red house, lies off the southern bank, to which it is connected by a drying shoal, about 2 miles eastward of the watch tower mentioned above. Between the watch tower and the western end of the island, an extensive bank on which are some islands, extends from the northern side of the river. The channel is northward of the island and between its eastern end and an islet lying close off the northern bank a little farther eastward; the town of Shih-lung stands on both sides of the river about 2 miles farther east-south-eastward.

There is a military station on the southern side of the river a short distance below Shih-lung with an island abreast it.

The Canton-Kowloon railway crosses the river by a bridge just below Shih-lung.

There is a tide-gauge on the bridge which gives the clearance under the bridge in Chinese characters. At low river the clearance would be a maximum of 30 feet (9^{m}1).

An overhead telegraph cable crosses the river close eastward of the railway bridge.

Anchorage.—Good anchorage can be obtained about a quarter of a cable below the bridge.

Tides.—Tidal streams.—The tide at Hsin-t'ang is about 5 hours after that at Hong Kong. With the river at datum level, there is a tidal range of up to 5 feet (1^{m}5) at Shih-lung, but probably little flood tidal stream is felt above Ti tong. With 5 feet (1^{m}5) above datum at Shih-lung there is little rise and fall above Ti tong, but the bars in the river are well covered.

Charts 2562, 2661a.

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Chart 2562.

Shih-lung.—Shih-lung (Sheklung) is a centre of the sugar trade. There are two missions in the town.

Tung chiang above Shih-lung.—Close eastward of Shih-lung, the Tung chiang trends sharply southward for a short distance and is joined by Sawshi channel. Above this junction, there are sharp turns, and the channel is much encumbered with sandbanks, and, in winter, is almost dry.

Chart 1262.

From Shih-lung to Tung min, the country is flat and cultivated; above that place there are low hills on both sides. Pokio, a walled town with a mission station, is situated on the northern bank of the river, about 11 miles below Heng-li-hsü.

Heng-li-hsü (Waichow) (*Lat. 23° 03′ N., Long. 114° 27′ E.*) is situated on the southern bank about 55 miles above Shih-lung. The town is built in two parts, divided by the Tamshui river, over which there is a bridge of boats.

Heng-li-hsü is connected to the general telegraph system and there is a post office; during the summer, there is communication with Shih-lung by steam launches.

Provisions are scarce.

The difference in the river level at Heng-li-hsü in summer and winter is reported to be 30 feet (9^{m}1).

Tamshui river.—This river joins the Tung chiang at Heng-li-hsü and is navigable by shallow-draught boats for a distance of 26 miles to Tamshuihu. The Samtohu river, which joins the Tamshui river 15 miles above Heng-li-hsü, is navigable by junks, drawing 2 feet (0^{m}6) for a distance of 64 miles to Samtohu.

Charts 2661a, 2661b, 1263.

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APPENDIX I

LIST OF PORTS AVAILABLE FOR UNDER-WATER REPAIRS, with Details of Largest Dry or Floating Dock or Patent Slip at each Port.

NAME OF PORT AND TYPE OF DOCK, &c.	Length from bilge of Caisson or Mitre Post of gates at		Maximum length of keel blocks	Breadth of Entrance at		‡ Distance {below (+) above (−)} Chart datum level of			Springs rise	FLOATING DOCKS, PATENT SLIPS, &c.			REMARKS
	Coping head	Floor head		Coping	MHWS level	Sill	Blocks, at			Maximum depth over blocks		Lifting power	
							Entrance	Head		Forward	Aft		
	(1)*	(2)*	(3)	(4)†	(5)†	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Tons	
BANGKOK:													
Royal Thai Naval Dockyard dock .	459·3	447·5	—	32·9	32·9	*12·1	—	—	—	—	—	—	*Depth of water over sill at M.H.W.S.
HAÏPHONG:													
Patent slip . . .	450·0	130·0 (cradle)	—	—	—	—	*10·0	*6·0	—	—	—	400	*Depth of water over blocks at M.H.W.S.
SAÏGON:													
Government yard dock	545·0	—	507·8	—	67·6	*28·4	*28·1	*28·1	—	—	—	—	*Depth of water over sill and blocks at M.H.W.S.
HONG KONG:													
Taikoo Dockyard and Engineering Co., Ltd., dock . .	787·0	783·4	750·0	93·3	92·3	†26·6	†26·3	†26·3	—	—	—	—	
H.M. Dockyard, Floating dock .	380·0	—	350·0	92·1 (overall)	50·0 (clear inside for	— docking)	—	—	—	19·0	19·0	2,750	
CANTON:													
Government dock .	350·0	280·0	—	—	37·0	*16·0	*14·3	*14·3	—	—	—	—	*Depth of water over sill and blocks at M.H.W.S.

* In the case of floating docks, patent slips, &c., column (1) = Extreme length. Column (2) = Length on blocks or cradle.
† In the case of floating docks, column (4) = Breadth at top. Column (5) = Breadth at bottom of dock.
‡ In order to find the depths on sill, &c., the quantities in columns (6), (7) and (8) should be applied according to sign to the predicted or calculated height of tide as obtained from the Admiralty Tide Tables.

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APPENDIX II

LIST OF PRINCIPAL PORTS, SHOWING PARTICULARS OF DEPTHS, &c.

PORT	Depth below Chart datum level		Rise of Tide		REMARKS
	In channel of approach	In anchorage	Spgs.	Nps.	
	Feet	Fathoms	Feet	Feet	
Bangkok	3 to 6	*4 to 5	10·0	—	*Inside entrance to river.
		*4½ to 5	—	—	*Outside the bar.
Saïgon	21	5 to 7	11·3	9·9	There are depths of from 17 to 28 feet alongside the wharves.
Baie de Cam-Ranh	Deep	6 to 8	5·6	—	
Baie de Nhatrang	Deep	5	5·8	—	
Baie de Vung Chao	Deep	3 to 4	6·2	—	
Baie de Qui-Nhon	16	5 to 6	5·6	—	
Baie de Tourane	Deep	4 to 8	4·1	—	
Haïphong	*11½	3½ to 8	8·5	—	*In 1950. There are depths of from 18 to 23 feet alongside the wharves.
Baie d' Halong	36	6 to 8	11·0	—	
Pakhoi	19	3½ to 5	15·1	—	
Hoihow	Deep	3½ to 5½	5·9	—	
Kuang-chou	20	7 to 10	12·1	—	
Hong Kong:					
West entrance	24	6 to 8	6·5	5·1	
East entrance	36	—	—	—	
Macao	*1½	2	9·1	6·5	*In 1946. The depths in the channel are constantly changing.
Huang-pu (Whampoa)	*12	4½ to 7	8·8	—	*In 1946. Over the Second bar. There is a depth of 30 feet alongside the Government wharf.
Canton	*4	2½ to 4½	5·7	4·5	There are depths of from 10 to 12 feet alongside the principal wharves. *In Li-chiao (Elliot barrier) in 1949.

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APPENDIX III

LIST OF SPOTS SUITABLE FOR MAGNETIC OBSERVATIONS

Place.	Lat.	Long.	Position.
	N.	E.	
SAÏGON . . .	10° 46′·5	106° 42′	In midst of open country used in native burial ground, lying north-westward of main city along Rue du General Lize and just over Saïgon–Cholon city limits, 116·5 feet south of Rue du General Lize, measured from point midway between sixth and seventh trees counted west from Rue de Thu Thaun, at a point on line with south edge of lone prominent rectangular concrete tomb and 100 feet west of south-west corner and 101 feet west of north-west corner; marked by round oak peg driven just below surface of ground. True bearings: left edge of chimney toward Cholon, 5 miles, 001° 21′·8; left edge of left radio mast, a quarter of a mile, 105° 48′; near corner of left target base at fork, one mile, 197° 20′·2; right edge of concrete tomb, 234° 55′·8; tip of spire of prominent church, 2 miles, 263° 04′·2.
PHAN THIET . .	10° 56′·2	108° 03′	In public park opposite Ecole de Plum-et-Circle (Old hotel), about 75 feet east of 1912 station, on east side of main road from railroad station to river bridge, on slight knoll near centre of triangle formed by main road to railroad and intersecting park paths, 42·5 feet north-east of corner of concrete base of telegraph pole, 48 feet east of hedge fence along main road, and 130·2 feet north-west of north corner of cement curb of well; marked by stake projecting 6 inches above ground used for tying horses. True bearings: Ornament on west end of building seen across rices, a quarter of a mile, 065° 43′·7; right edge of school house, 135° 40′·9; west corner of concrete well curb, 326° 40′·6.
HUÉ	16° 27′·8	107° 32′	In a small public park along Rivière de Hué between the Mayor's office and the Annamese war memorial, 280 feet north-east of a drainage canal, 125 feet south-west of edge of mound on which stood the Annamese war memorial, and 180 feet north-west of near edge of footpath on Rue Jules Ferry. True bearings: North edge of first pier on south end of railroad bridge, 088° 28′·6; east edge of stone rampart around citadel, 166° 29′; north side of west pier of footbridge, 212° 15′·9; top of Annamese war memorial, 234° 36′·4.

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Place.	Lat.	Long.	Position.
	N.	E.	
VINH	18° 40′·3	105° 40′	Near north-west corner of stadium which was immediately west of the citadel, 141 feet from north-west corner post of football ground, and 36·5 feet from nearest point of west boundary of the football field. True bearings: Ornament on house to south, 001° 28′·4; down-sport on house to south, 001° 34′·5; lightning rod on spire of cathedral over roof of grand stand, 017° 9′·7; peak of mountain to north-west, 138° 58′·5; top of north-west corner post of football ground, 163° 8′·9; top of north-east corner post of football ground, 250° 15′·8; right edge of water table of hospital, 300° 38′·9.
PHU LIEN. . .	20° 48′·4	106° 38′	On the grounds of Haiphong observatory, on north slope of Observatory hill, in line between main observatory and equatorial domes, in midst of level terrace designated by the Director of the observatory as proposed site of his magnetic houses; marked by round teak wood peg with countersunk centre driven flush with the ground. True bearings: Middle one of three vertical edges of low fort building on hill, 051° 37′·4; cross on top of Catholic church, among some trees in plain, 15 kilometres, 169° 05′·2.
YULING CHIANG .	18° 10′·8	109° 30′	On shore near south-western corner of inner bay of Yuling chiang, almost due south of the leading beacon on the north shore; eight paces from low water mark and three paces east of path from shore to undergrowth. The station is marked by an oak stake driven flush with the ground. The centre, near base, of leading beacon, bears 358° 46′·7.
CAPE KAMI . .	20° 13′·1	109° 52′	On top of a sandy mound on an island lying between the lighthouse and the mainland at southern extremity of Lui-chow peninsula, 65 paces northward of high water beach mark, and about 2,000 feet from lighthouse; marked by small wooden peg, covered with flat black stones, piled in the form of a cone about 18 inches high. The vane on the light-house tower bears 058° 47′·7.
TS'ANG-WU (WUCHOW)	23° 28′·4	111° 16′	On lawn eastward of Botanical Research Institute of Kwangsi University, on top of hill overlooking junction of Fu river and Hsi chiang (West river), 9·1 feet from nearest fir tree to south; marked by stone post 4·5 × 4·6 × 19 inches pro-jecting 2 inches above ground and inscribed "1935" with four Chinese characters meaning Wuchow Magnetic Station and a small circle cut in top of stone. True bearings: Lower south-east corner of Botanical Research Institute building 114·9 feet, 079° 12′·2; upper north-east corner of Botanical Research Institute building, 103° 38′·7; south-east corner of brick pillar to north, 161° 24′.

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Place.	Lat.	Long.	Position.
	N.	E.	
YUNG-NING (NANNING)	22° 50′·2	108° 20′	Outside city on piece of flat land about 440 yards north of main building of the Bureau of Animal Industry, 115 feet from the nearest point of pond eastward, and 128 feet from nearest point of pond southward; marked by stone 5 × 5 × 24 inches projecting 2 inches above ground, and inscribed " 1935 ", with four Chinese characters meaning Nanning Magnetic Station, and a small cross cut in top of stone. True bearings: Right-hand radio tower, 28° 11′·8; pagoda to south, 321° 31′·4; north-west edge of water tower of Bureau of Animal Industry, 336° 55′.
CANTON . . .	23° 06′·3	113° 18′	On football field east of Campus of Lingnan University, in line between the two south goal posts and midway between them, 154·2 feet from south goal post to west (as situated in 1935); marked by stone post 6 × 6 × 16 inches set with top 4 inches below ground level and lettered " CIW 1935 ", with drill hole in top to indicate exact spot. True bearings: Clock tower ornament on top of Grant Hall, 116° 22′·4; centre of chimney at left end of Dr. Kipp's house, 295 feet, 167° 23′·6; pagoda to north-east, 2 miles, 254° 14′; north-east edge of girls' dormitory, 590 feet, 312° 53′.

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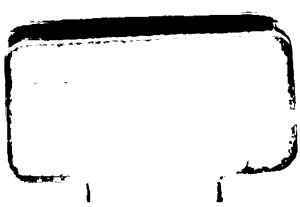

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